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Vol. 946 Number 1

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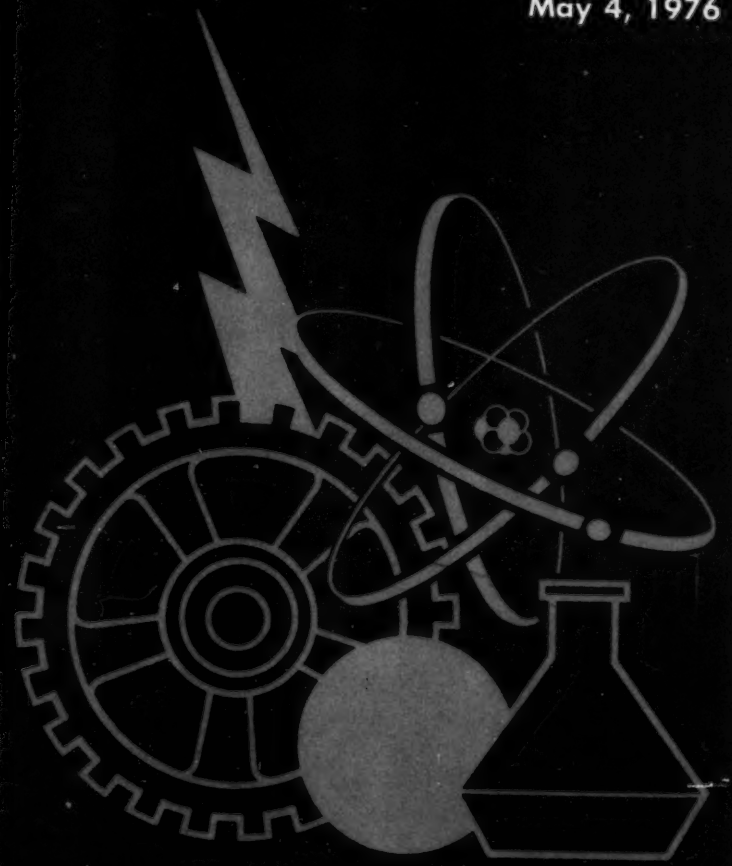
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

May 4, 1976



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

May 4, 1976 Volume 946 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent and Trademark Office Advisory Committee

Meeting

The Patent and Trademark Office Advisory Committee will meet from 10:00 a.m. to 5 p.m. on May 24, 1976, in Room 3–11C28 (Commissioner's Conference Room), Patent and Trademark Office, Crystal Plaza Building 3, Arlington, Virginia.

This Committee was established on December 15, 1975 to advise the Patent and Trademark Office on matters concerning the patent system and the administration of the Office. Since this will be the first meeting of the Committee, this morning session will be devoted to a general briefing on operations of the Patent and Trademark Office and a tour of the office facilities at Crystal Plaza.

The agenda for the afternoon session is:

(1) A general discussion of the effectiveness of the patent system and of the patent operations of the Patent and Trademark Office in fulfilling the needs of the nation.

(2) Consideration of what steps should be taken by the Patent and Trademark Office to improve its patent operations.

(3) Specfic evaluation of short term (1976–1977) objectives of the Patent and Trademark Office, including views as to how they might be achieved.

The meeting will be open to public observation; approximately 15 seats will be available for the public on a first-come first-served basis. A period will be set aside for oral comments or questions by public observers of 3 minutes per individual on each of the agenda items. More extensive comments or questions should be submitted in writing before May 21. Other public statements may be submitted at any time before or after the meeting.

Copies of the minutes will be available on request 30 days after the meeting.

Inquiries may be addressed to the Committee Control Officer, Herbert C. Wamsley, Office of the Commissioner of Patents and Trademarks, Washington, D.C. 20231, telephone: 703–557–3071; or to the Executive Secretary, David B. Allen, Office of Legislation and International Affairs, Patent and Trademark Office, Washington, D.C. 20231, telephone: 703–557–3065.

Dated: March 25, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved:

BETSY ACKNER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc. 76–9801; Filed 4–5–76; 8:45 am]

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,962,176, J. D. Russell, LOW HEIGHT SHUTTLE CAR, **filed** Oct. 28, 1975, D.C., W.D. Pa. (Pittsburgh) Doc. 75–1375, *FMC Corporation* v. *Joy Manufacturing Company.*

3,148,598, J. S. Davis, MAKING BAGS WITH ENCLOSED STIFFENER AT TOP; **Re. 26,075,** L. E. Canno, METHOD OF MAKING REINFORCED PLASTIC BAGS, **filed** Sept. 12, 1975, D.C., S.D.N.Y., Doc. 75–C–4502, *Equitable Bag Co., Inc.* v. *Rexham Corporation.* Voluntary dismissal under Rule 41(a)(1)(i), Sept. 16, 1975.

3,215,072, Kooch and Fennimore, ADDRESS CARD; **3,526,262,** H. Yoshida, ADDRESS MASTER CARD; **Reg. No. 764,325** (SCRIPTAMASTER), Scriptomatic, Inc.; **Reg. No. 785,470** (SCRIPTOMATIC), same; **Reg. No. 785,623,** same, **filed** Oct. 31, 1971, D.C. Minn. (Minneapolis) Doc. 4–75–C–554, *Scriptomatic, Inc.* v. *Speedaddress, Inc. et al.*

3,223,450, C. R. Pollock, UPHOLSTERED FURNITURE: **D. 204,257,** same, ARMCHAIR, **filed** Sept. 26, 1975, D.C., E.D. Pa. (Philadelphia) Doc. 75–2527, *Knoll International, Inc. and Charles R. Pollock* v. *Continental Imports, Inc.*

3,242,331, Behringer and Burhoe, PORTABLE LIGHT, **filed** Dec. 23, 1975, D.C., N.D. Ohio (Cleveland) Doc. C75–1153, *Greenbriar Mfg. Co. and Rankin Products, Inc.* v. *New Era Products, Inc. and Gary W. West.*

3,310,435, Robinson, Jr., Steelman, Jr. and Perkins, Jr., PROCESS FOR CONTINUOUS PICKLING OF STEEL STRIP AND REGENERATION OF THE CONTACT ACID; **3,445,284,** same; **3,669,623,** Allison, Hatfield, and Frumerman, METHOD FOR THE REGENERATION OF HYDROCHLORIC ACID FROM SPENT PICKLE LIQUOR AND LIKE SOLUTIONS, **filed** Oct. 28, 1975, D.C., W.D. Pa. (Pittsburgh) Doc. 75–1377, *Woodall Duckham (USA) Ltd.* v. *Dravo Corporation.*

3,340,987, D. G. Bastian, REPEAT-CHARACTER-DELAY CODE TRANSLATOR, **filed** Nov. 6, 1972, D.C.N.J. (Newark) Doc. C–1794–72, *George B. Green* v. *The Singer Company.* Stipulation and order of dismissal of action, Dec. 31, 1975.

3,361,858, O. Wichterle, RESHAPING A XEROGEL BY MECHANICAL REMOVAL AND SWELLING TO FORM A HYDROGEL CONTACT LENS; **3,822,089,** CONTACT LENS BLANK OR REPLICA MADE FROM ANHYDROUS, SPARINGLY CROSS-LINKED HYDROPHILIC COPOLYMERS; **Re. 27,401,** Wichetерle and Lim, CROSS-LINKED HYDROPHILIC POLYMERS AND ARTICLES MADE THEREFROM, **filed** Nov. 12, 1975, D.C. Del. (Wilmington) Doc. 75–366, *Milton Roy Company and Milroy-Automated, Inc.* v. *Bausch & Lomb, Inc. et al.*

3,445,284. (See 3,310,435.)

3,511,352, G. B. Greene, AUTOMATIC BAR TYPEWRITERS AND THE LIKE HAVING ROLL-CAM TYPE DRIVE MECHANISMS, **filed** Oct. 30, 1970, D.C.N.J. (Newark) Doc. C1467-70, *George B. Greene* v. *The Singer Co.* Stipulation and order of dismissal of action, Dec. 31, 1975.

3,526,262. (See 3,215,072.)

3,557,469, D. C. Edgington, GRAPHIC ARTS FILM DRYER; **3,800,434,** Edgington and Edgington, same, **filed** Oct. 8, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c3386, *Donald C. Edgington et al.* v. *Buckingham Graphics, Inc. et al.*

3,665,583, J. F. Helderman, SUSPENSION CLIP STRUCTURE AND APPARATUS AND METHOD FOR SECURING SAME TO A WORK SURFACE; **3,805,472,** same, **filed** Sept. 19, 1975, D.C., E.D. Pa. (Philadelphia) Doc. 75–2652, *Ladd Tool Company, Inc.* v. *Hilti Fastening Systems and Aberthaw Construction Co. Inc.*

3,669,623. (See 3,310,435.)

3,701,451, Schindler and McEachron, MOLDED ELECTRICAL JUNCTION BOX; **3,740,451,** same; **3,862,351,** same; **3,873,750,** same, ELECTRICAL ENCLOSURE KNOCKOUT STRUCTURE; **Re. 28,759,** same, MOLDED ELECTRICAL JUNCTION BOX, **filed** Oct. 9, 1975, D.C., E.D. Tex. (Sherman) Doc. S–75–97–CA, *Nelco Corporation* v. *U.S. Industries, Inc. and Capital Wire & Cable Corp.*

3,705,976, M. M. Platzman, REVENUE CONTROL SYSTEM FOR ROLL ROADS, **filed** Jan. 8, 1976, D.C., S.D.N.Y., Doc. 76–C–87 KTD, *Michael M. Platzman* v. *Automatic Toll Systems, Inc.*

3,740,451. (See 3,701,451.)

3,800,434. (See 3,557,469.)

3,822,089. (See 3,361,858.)

3,862,351. (See 3,701,451.)

3,867,005, P. P. Hoppe, Jr. INSULATION-PIERCING CONTACT MEMBER AND ELECTRICAL CONNECTOR; **Reg. No. 690,477** (MICRO RIBBON), Bunker Ramo Corporation, **filed** Oct. 23, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c3563, *Bunker Ramo Corporation* v. *TRW Inc.*

3,873,750. (See 3,701,451.)

3,876,322, M. W. Deason, EXPANSION DRAIN, **filed** Jan. 5, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV 76–19–WMB, *Harco Products* v. *Max W. Deason, doing business as Mortex Manufacturing Company.*

Re. 26,075. (See 3,148,598.)

Re. 27,401. (See 3,361,858.)

Re. 28,489. (See 3,701,451.)

D. 237,121, M. J. Metzner, TOOL CHEST OR SIMILAR ARTICLE; **Reg. No. 984,447** (JUST IN CASE), Glovermakers, Inc., doing business as Sterling Novelty Products, **filed** Oct. 31, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c3688, *Glovemaker, Inc.* v. *M. B. Daniels and Co. Inc.*

Reg. No. 690,477. (See 3,867,005.)

Reg. No. 764,325. (See 3,215,072.)

Reg. No. 785,470. (See 3,215,072.)

Reg. No. 785,623. (See 3,215,072.)

Reg. No. 984,447. (See D. 237,121.)

2,896,217, V. E. Cedarstaff, SLIDE FOR A NECKTIE, **filed** Feb. 2, 1976, D.C. Ariz. (Phoenix), Doc. C–76–73 Phx-CAM, *Vic Cedarstaff* v. *John Fox, et ux.*

2,931,532, R. H. Gapp, RIVETS AND METHOD OF RIVETING; **3,825,121,** G. Siebol, BLIND RIVET, **filed** Jan. 15, 1971, D.C. S.D. Ohio (Cincinnati), Doc. 7827, *Olympic Fastening Systems, Inc.* v. *Textron, Inc.* Final judgment of Sept. 17, 1973 is hereby vacated. Patent is valid, and judgment is entered in favor of defendant, Jan. 19, 1976.

3,043,868, W. P. Lear, MAGNETIC TAPE CARTRIDGE SYSTEM, **filed** Oct. 17, 1974, D.C. Ariz. (Phoenix), Doc. C–74–673 Phx, *The Gates Rubber Company* v. *Data Packaging Corporation et al.* Stipulation and order of dismissal, Feb. 5, 1976.

3,054,057, Bettin, Hahnel, Harrison and Schwittek, DIGITALLY TUNED TRANSMITTER-RECEIVER; **3,060,329,** Harrison, Lennon and Van Sandwyk, AUTOMATIC GAIN CONTROL GENERATOR FOR RECEIVERS; **3,061,742,** J. E. R. Harrison, STABLE TRANSISTOR FREQUENCY CHANGER HAVING A STABLE MULTIVIBRATOR WITH SYNCHRONIZING PULSE INPUT, **3,151,301,** R. R. Bettin, LINEAR RADIO FREQUENCY POWER AMPLIFIER HAVING CAPACITIVE FEEDBACK, **filed** Jan. 26, 1976, U.S. Court of Claims (District of Columbia), Doc. 21–76, *General Dynamics Corporation* v. *The United States.*

3,060,329. (See 3,054,057.)

3,061,742. (See 3,054,057.)

3,072,342, C. H. MacFarland, LIQUID SPRAYER, **filed** Feb. 3, 1976, D.C., M.D. Fla. (Jacksonville), Doc. 76–4–C–Oc, *The Scott & Fetzer Company* v. *The Bison Company.*

3,151,301. (See 3,054,057.)

3,181,939, Marshall and Roshuck, FUSED ALUMINA-ZIRCONIA ABRASIVES, **filed** Aug. 22, 1975, U.S. Court of Appeals for the First Circuit, Massachusetts (Boston), Doc. 75–1309, *Norton Company* v. *Carborundum Company.* The judgment of the District Court is affirmed, Feb. 13, 1976, same, **filed** Aug. 22, 1975, United States Court of Appeals for the First Circuit, Massachusetts (Boston), Doc. 75–1310, *Norton Company* v. *Carborundum Company.* The judgment of the District Court is affirmed, Feb. 3, 1976.

3,285,151. (See 2,931,532.)

3,371,963, F. D. Weller, MANUFACTURE OF FURNITURE, **filed** Nov. 20, 1973, D.C., E.D. Wis. (Milwaukee) Doc. 73–C–627, *Alton Box Board Company* v. *Hayes Manufacturing Inc. and Laminations Corp.* Consent judgment, patent is valid and owned by plaintiff, plaintiff dismisses the complaint with prejudice as to the defendant, Laminations Corporation and without prejudice as to the defendant, Hayes Manufacturing, Inc. Defendants counterclaim for declaratory judgment is hereby dismissed with prejudice by the defendant, Laminations Corporation, but without prejudice by the defendant, Hayes Manufacturing Inc., Feb. 9, 1976.

3,420,289, A. V. Bejarano, CONCEALED TIE BACK AND RETURN HOLDER FOR DRAPERY, **filed** Feb. 4, 1976, D.C., S.D.N.Y., Doc. 76–0569, *Alexander* v. *Bejarano and Instrument Systems Corp.* v. *Kirsch Company.*

3,625,758. Stahl, Steffen, Schneble and McCormack, BASE MATERIAL AND METHOD FOR THE MANUFACTURE OF PRINTED CIRCUITS, **filed** Feb. 9, 1976, D.C. Del. (Wilmington), Doc. 76–63, *Kollmorgen Corporation* v. *RCA Corporation.*

3,887,268, Golden and Kennedy, FLASHING REFLECTOR SYSTEM, **filed** Oct. 14, 1975, D.C.,N.D. Ill. (Chicago), Doc. 75c3451, *Beatrice Foods Company* v. *Tsuyama Mfg. Company Ltd.*

PATENT NOTICES

Certificates of Correction for the Week of May 4, 1976

Re. 28,643	3,897,474	3,922,381	3,934,080
D. 237,216	3,898,088	3,922,919	3,934,137
3,581,966	3,898,100	3,923,346	3,934,322
3,665,244	3,899,550	3,923,424	3,934,382
3,674,632	3,900,423	3,923,818	3,934,472
3,711,841	3,900,452	3,923,892	3,934,594
3,766,370	3,901,725	3,924,249	3,934,728
3,769,621	3,901,843	3,924,262	3,934,731
3,789,027	3,901,874	3,924,542	3,934,837
3,796,676	3,902,381	3,924,759	3,934,901
3,804,502	3,903,061	3,925,072	3,935,006
3,817,753	3,904,517	3,925,140	3,935,085
3,822,210	3,905,887	3,925,313	3,935,162
3,826,689	3,907,003	3,925,714	3,935,197
3,827,611	3,907,198	3,926,119	3,935,205
3,832,322	3,907,621	3,926,753	3,935,262
3,832,397	3,909,225	3,926,755	3,935,267
3,835,108	3,910,313	3,926,982	3,935,705
3,846,347	3,910,761	3,927,014	3,935,766
3,850,251	3,910,825	3,927,044	3,935,983
3,852,452	3,911,478	3,927,266	3,935,997
3,853,225	3,911,728	3,927,275	3,936,008
3,859,099	3,912,664	3,927,477	3,936,098
3,859,375	3,912,811	3,927,861	3,936,220
3,859,820	3,913,256	3,928,174	3,936,411
3,860,522	3,913,472	3,928,184	3,936,424
3,861,833	3,913,765	3,928,195	3,936,964
3,862,180	3,913,799	3,928,246	3,937,039
3,863,936	3,913,936	3,928,366	3,937,048
3,867,037	3,914,316	3,928,416	3,937,082
3,867,420	3,914,747	3,929,241	3,937,221
3,868,407	3,915,763	3,929,296	3,937,253
3,868,535	3,915,795	3,929,596	3,937,394
3,870,487	3,915,804	3,929,733	3,937,565
3,873,645	3,915,883	3,929,888	3,937,649
3,875,607	3,916,496	3,930,080	3,937,710
3,876,770	3,916,497	3,930,285	3,938,093
3,880,728	3,916,900	3,930,855	3,938,175
3,884,670	3,917,488	3,931,026	3,938,383
3,884,920	3,917,727	3,931,029	3,938,482
3,885,094	3,918,070	3,931,140	3,938,855
3,886,197	3,918,179	3,931,158	3,938,876
3,886,378	3,918,678	3,931,250	3,939,047
3,886,598	3,918,964	3,931,323	3,939,105
3,888,678	3,919,125	3,931,722	3,939,110
3,888,994	3,919,451	3,932,155	3,939,216
3,891,399	3,919,475	3,932,442	3,939,456
3,891,457	3,919,484	3,932,740	3,939,655
3,892,522	3,919,835	3,932,993	3,940,096
3,892,806	3,919,961	3,933,283	3,941,180
3,894,081	3,920,462	3,933,335	3,941,246
3,896,110	3,921,538	3,933,427	3,942,067
3,896,211	3,921,575	3,933,493	
3,897,253	3,922,178	3,933,874	

Dedications

Design No. 220,597.—*Clifford I. Dawson* and *Dallas G. Molerin*, San Jose, Calif. MAGNETIC DISK CARTRIDGE JACKET. Patent dated Apr. 27, 1971. Dedication filed Mar. 18, 1976, by the assignee, *International Business Machines Corporation.*

Hereby dedicates to the People of the United States, the remaining term of said patent.

Design No. 221,155.—*Edward D. Lucey*, Los Gatos, and *Noel S. Ferguson*, San Jose, Calif. DISK PACK ASSEMBLY. Patent dated July 13, 1971. Dedication filed Mar. 18, 1976, by the assignee, *International Business Machines Corporation.*

Hereby dedicates to the People of the United States, the remaining term of said patent.

Design No. 221,232.—*Clifford I. Dawson* and *Dallas G. Molerin*, San Jose, Calif. MAGNETIC DISK CARTRIDGE. Patent dated July 20, 1971. Dedication filed Mar. 18, 1976, by the assignee, *International Business Machines Corporation.*

Hereby dedicates to the People of the United States, the remaining term of said patent.

Design No. 221,605.—*John C. Davey*, Wiltshire, *Hugh G. Dickie*, Hampshire, *Albert H. Metcalfe*, Hampshire, and *Leo J. Rigbey*, Hampshire, England. CONTAINER FOR MAGNETIC RECORDING DISC. Patent dated Aug. 24, 1971. Dedication filed Mar. 18, 1976, by the assignee, *International Business Machines Corporation.*

Hereby dedicates to the People of the United States, the remaining term of said patent.

3,473,372.—*Manfred Klink*, Korb, Kreis Waiblingen, Germany. APPARATUS FOR MEASURING ENGINE OIL CONSUMPTION. Patent dated Oct. 21, 1969. Dedication filed Mar. 22, 1976, by the assignee, *Daimler-Benz Aktiengesellschaft.*

Hereby dedicates to the Public the remaining term of said patent.

Printed Copies of Trial Voluntary Protest Program Applications

In ordering copies of patent applications printed under the Trial Voluntary Protest Programs (923 O.G. 2, June 4, 1974 and 938 O.G. 945, September 16, 1975), it is requested that the information identifying the application (the letter "B" plus the Serial No.) also include the publication date of the printed application.

Apr. 13, 1976.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

Disclaimer and Dedication

3,821,416.—*Granville B. Thompson*, Crestwood, and *Robert D. Seeley*, Columbia, Mo. DRIED BREWERS GRAIN IN HIGH ENERGY ANIMAL FEEDS. Patent dated June 28, 1974. Disclaimer and dedication filed Mar. 17, 1976, by the assignees, *The Curators of the University of Missouri* and *Anheuser-Busch, Incorporated.*

Hereby disclaim and dedicate to the Public the term of said patent subsequent to Mar. 15, 1976.

Disclaimers

3,030,891.—*Stephen M. Taylor*, Minneapolis, Minn. LIQUID SUPPLY PUMPING SYSTEM. Patent dated Apr. 24, 1962. Disclaimer filed Mar. 22, 1976, by the assignees, *Stephen M. Taylor* and *Walter S. Carpenter.*

Hereby enter this disclaimer to claims 1, 2, 3, 7, 8, 9, 10, 15, 18 and 19 of said patent.

3,696,651.—*Robert Henry Harrison*, Sheffield, England. FORGING MANIPULATOR. Patent dated Oct. 10, 1972. Disclaimer filed Mar. 17, 1976, by the assignee, *Davy-Loewy Limited.*

Hereby enters this disclaimer to claim 1 of said patent.

3,764,929.—*Joseph Ferriera Alves III*, Milford, N.J. PUSH-PULL DARLINGTON AMPLIFIER WITH TURN-OFF COMPENSATION. Patent dated Oct. 9, 1973. Disclaimer filed Mar. 15, 1976, by the assignee, *RCA Corporation.*

Hereby disclaims the remaining term of said patent.

3,832,857.—*Max Bassett,* Houston, Tex. PRESSURE GROUTING. Patent dated Sept. 3, 1974. Disclaimer filed Mar. 11, 1976, by the assignee, *C. Nelson Shields, Jr., trustee.*

Hereby enters this disclaimer to claim 9 of said patent.

3,868,684.—*Ewing D. Nunn, Jr.,* Fullerton, Calif. EMERGENCY VEHICLE SIREN SWITCHING APPARATUS. Patent dated Feb. 25, 1975. Disclaimer filed Feb. 2, 1976, by the inventor.

Hereby enters this disclaimer to claims 1 and 3 of said patent.

3,920,912.—*Harold Peter Anderson* and *Carl Calvin Nielson,* Boulder, Colo. HOTEL PBX ELECTRONIC MESSAGE BILLING ARRANGEMENT. Patent dated Nov. 18, 1975. Disclaimer filed Mar. 8, 1976, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 1, 2, 4 and 6 of said patent.

3,931,257.—*Beverly Ann Pawson,* Montclair, N.J. POLYENE COMPOUNDS. Patent dated Jan. 6, 1976. Disclaimer filed Mar. 8, 1976, by the assignee, *Hoffmann-La Roche Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,935,852.—*John J. Donovan,* West Springfield, and *Daniel R. Isham,* Hampden, Mass. SPARK PLUG CONNECTOR AND IGNITION COIL MODULE FOR ENGINE IGNITION SYSTEM. Patent dated Feb. 3, 1975. Disclaimer filed Feb. 17, 1976, by the assignee, *R. E. Phelon Company, Inc.*

Hereby enters this disclaimer to claim 2 of said patent.

3,941,712.—*Peter J. Ferrara,* Cornwall, N.Y., *Gaston Dalby,* St. Germain du Salembre, Neuvic-sur-L'Isle, France, *Clarence A. Barnes, Jr.,* New York, and *Roy Gordon,* New York, N.Y. SOAP COMPOSITION AND PROCESS OF PRODUCING SUCH. Patent dated Mar. 2, 1976. Disclaimer filed Sept. 29, 1975, by the inventors.

Hereby enters this disclaimer to all claims of said patent.

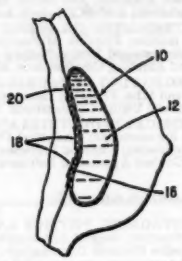
Errata

All reference to Patent No. 3,928,138 to Louis L. Wood, Frank J. Hartdegen and Peter A. Hahn of Maryland for "Preparation and Use of Enzymes Bound to Polyurethane" appearing in the OFFICIAL GAZETTE of December 23, 1975 should be deleted since no patent was granted.

All reference to Design Patent No. 239,308 to Rodney D. Bufton, for "Flower Pot" appearing in the OFFICIAL GAZETTE of March 23, 1976 should be deleted since no design patent should have been granted.

All references to Peter B. Cooper and W. L. Gore and Associates as the patentee and assignee, respectively, of Patent No. 3,902,198, appearing in the OFFICIAL GAZETTE of September 2, 1975, should be deleted as the patent issued to Arthur H. Rathjen and the Dow Corning Corporation.

Moreover, the drawing shown under Patent No. 3,902,198 on page 15 in the OFFICIAL GAZETTE of September 2, 1975 is in error. The following drawing should have been printed instead:



PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 10, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-15-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-9-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-14-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	3-5-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-5-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	2-27-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-16-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-22-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-10-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-19-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-19-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-13-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-15-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-30-75

Expiration of patents: The patents within the range of numbers indicated below expire during April 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,880,419 to 2,884,633 inclusive
Plant Patents..... Numbers 1,825 to 1,828 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED MAY 4, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T946,001

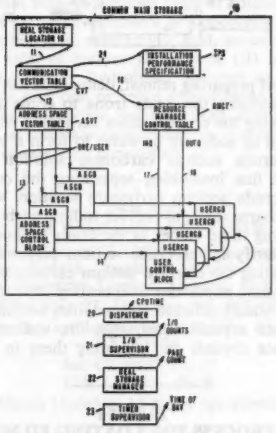
PERFORMANCE DRIVEN WORKLOAD MANAGER

Josiah B. Page, Pougskeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of abandoned application Ser. No. 417,847, Nov. 21, 1973. This application Mar. 3, 1975, Ser. No. 554,865

Int. Cl. G06f *9/19*
U.S. Cl. 444—1

4 Sheets Drawing. 23 Pages Specification



A process for managing the workload in the environment of a terminal oriented date processing system of the type having a virtual memory system and the capabilities of swapping jobs in-and-out of real storage and of over-initiating jobs to saturate the system. An installation performance specification defines in the system different performance objectives which different groups of users or jobs are to be managed to. Key parameters associated with the use of system resources are monitored. On a periodic basis, the workload managing process is performed which determines the current service rates of swapped-in users from the monitored data, the anticipated service rates of swapped-out users, and the normalized levels of all users. Two users, one swapped-in and the other swapped-out, are swapped or exchanged if the normalized level of the swapped-out user is greater than that of a swapped-in user.

T946,002

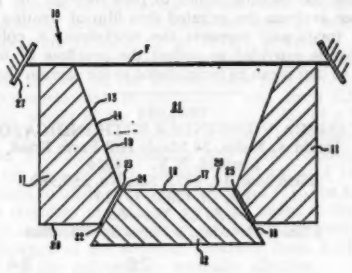
MOLD AND METHOD OF THERMOFORMING USING SUCH MOLD

David Harris Berkebile, 611 Mowrer Road, Circleville, Ohio 43113

Continuation of application Ser. No. 455,804, Mar. 28, 1974, which is a division of applicaton Ser. No. 333,530, Feb. 20, 1973, both now abandoned. This application Mar. 6, 1975, Ser. No. 555,999

Int. Cl. B29c *17/04*
U.S. Cl. 425—388

1 Sheet Drawing. 16 Pages Specification



A mold **10** for vacuum thermoforming polyester film and having parts defining a cavity **21** including:

an outer body part **11** having an inner surface **13** with first portions **14** of such surface defining a cavity body surface **19**;

an inner bottom part **12** having an inner surface **16** with first portions **17** of such surface defining a cavity bottom surface **20**;

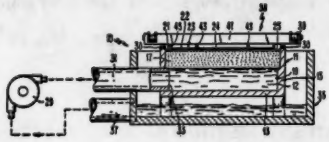
such cavity body and cavity bottom surfaces defining an inner surface of such cavity;

such body and bottom parts **11** and **12** being spaced from each other at the juncture of the lower circumferential edge **23** of the cavity body surface **19** and the upper circumferential edge **24** of the cavity bottom surface and defining an entrance **25** to a circumferential passageway **22** therebetween;

such entrance **25** to the passageway **22** being less than about 0.0003 inch wide at such juncture.

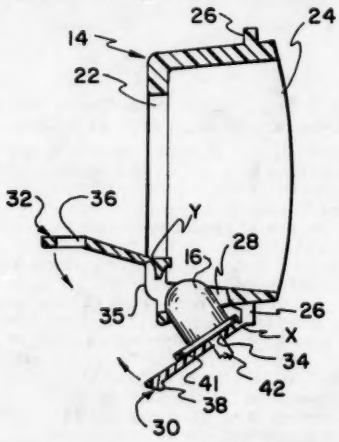
A method of thermoforming is provided using this mold.

T946,003
FLOAT CONTACTING PROCESS AND APPARATUS
Patsy R. Fontanarosa, Yorktown Heights, Edward P. Hecker, Wappingers Falls, and Claude G. Metreaud, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of application Ser. No. 432,725, Jan. 11, 1974, which is a continuation of application Ser. No. 252,060, May 10, 1972, both now abandoned. This application Mar. 10, 1975, Ser. No. 556,610
Int. Cl. B08b *3/02, 3/08;* H01l *21/306*
U.S. Cl. 134—3
2 Sheets Drawing. 12 Pages Specification



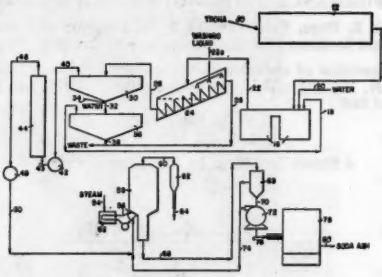
A process and apparatus for treating a workpiece, such as a semiconductor wafer, floats the wafer on the surface of a thin, 1/64 to 3/32 inch thick, agitated film of treating liquid. The film is renewed and agitated by fresh liquid which is fed as a multitude of small streams through the pores of a porous track member such as a sheet of porous polyethylene or a fine mesh screen. The streams provide a scrubbing action on the surface of the workpiece so as to uniformly remove portions of the surface. The apparatus includes a solid bottom and sidewalls which together with the porous track member form a plenum chamber. A pump continuously introduces a supply of treating liquid under pressure into the plenum chamber to cause the treating liquid to pass through the porous member to form the agitated thin film of treating liquid which treats and supports the workpiece. A collecting chamber is provided to collect the overflow of treating liquid so that it can be recirculated to the plenum chamber.

T946,004
CAMERA VIEWFINDER WITH INDICATOR
David A. Siefer, 39 Maple Hill Farm Road, Penfield, N.Y. 14526
Filed Mar. 19, 1975, Ser. No. 559,960
Int. Cl. G03b *17/20*
U.S. Cl. 354—53
1 Sheet Drawing. 6 Pages Specification



A camera warning indicator is positioned and secured at the entrance of a viewfinder housing by cooperating positioning and securing members of the viewfinder housing. The positioning and securing members are integral with the viewfinder such that the indicator is positioned by one member to be viewable through the viewfinder housing, while the other member is foldable to lock the first member in position to secure the indicator within the viewfinder housing.

T946,005
PRODUCTION OF SODIUM CARBONATE
William Dean Smith, Richard W. Waggener, and Gordon J. Huddleston, Green River, Wyo., assignors to Intermountain Research and Development Corporation
Continuation of application Ser. No. 393,975, Sept. 4, 1973. This application Mar. 21, 1975, Ser. No. 560,927
Int. Cl. C02o *7/00*
U.S. Cl. 423—206 T
1 Sheet Drawing. 23 Pages Specification



Method of preparing refined, dense soda ash from crude trona by calcining the crude trona to crude sodium carbonate, mixing the crude sodium carbonate with an aqueous solution of soda ash or water to form a substantially saturated crude sodium carbonate solution containing coarse and fine insolubles, separating the coarse solids from the crude sodium carbonate solution, washing the separated coarse solids to recover sodium carbonate values and returning these values to the crude sodium carbonate solution, clarifying the crude sodium carbonate solution, carbon treating the clarified sodium carbonate solution to remove organic impurities, evaporating the carbon-treated sodium carbonate solution to crystallize sodium carbonate monohydrate crystals, separating the sodium carbonate monohydrate crystals and calcining them to dense soda ash.

T946,006
PROCESS FOR COATING FILMS
Roger Sidney Arthur Kelly, Stevenage, and John Robert Wilson, Knebworth, England, assignors to Imperial Chemicals Industries Limited, London, England
Filed Mar. 24, 1975, Ser. No. 561,664
Claims priority, application Great Britain, Mar. 29, 1974, 13,992/74
Int. Cl. B32b *5/16, 27/08, 3/00*
U.S. Cl. 428—129
No Drawing. 18 Pages Specification

A process for the production of a coated film is disclosed which comprises coating a self-supporting synthetic plastics film such as polyethylene terephthalate with an aqueous latex or solution comprising an unhydrolysed or a partially hydrolysed polymer or copolymer of vinyl acetate, the copolymer formed with a comonomer comprising a dialkyl maleate, 2-ethylhexyl acrylate, ethylene vinyl chloride or a vinyl ester of versatic acid and comprising at least 50 (preferably 70–90) mole percent of vinyl acetate, and one or more resinous components capable of intra-molecular cross-linking. These materials

include epoxy resins, alkyd resins and the condensation product of melamine and formaldehyde.

Coated films thus prepared are useful as magnetic recording materials, drafting films, slot liners for electrical motors, packing materials and as a carrier for the releasable layer in carbon paper. The end use of the coated films so prepared depend upon the nature and amount of additives contained in the aqueous coating latex or solution. For example, finely divided silica particles included in the coating may be used to produce a drafting or writing film having a rough surface thereon for receiving pencil markings or the like.

The disclosed procedure has advantage in that the coating is applied after processing of the base material, as in the case of polyethylene terephthalate after biaxial orientation and heat setting.

T946,007

PROCESS FOR COATING FILMS

Roger Sidney Arthur Kelly, Stevenage, and John Robert Wilson, Knebworth, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 24, 1975, Ser. No. 561,665

Claims priority, application Great Britain, Mar. 29, 1974, 13,991/74; 13,992/74

Int. Cl. H01f *10/02*
U.S. Cl. 428—483

No Drawing. 14 Pages Specification

Magnetic recording materials are produced by coating a plastics film with an aqueous latex or solution comprising (i) one or more polymers or copolymers of one or more of acrylic acid, methacrylic acid, an ester of acrylic acid or an ester of methacrylic acid or (ii) an unhydrolysed or a partially hydrolysed polymer or copolymer vinyl acetate and one or more cross-linking components magnetically susceptible particles. The coating may be applied to a substrate comprising an acrylic or methacrylic acid or ester or a copolyester.

T946,008

WEB WINDING APPARATUS

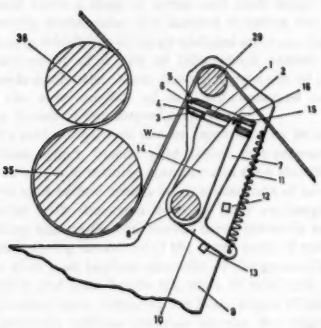
Nigel Colin Benson, Ickleford, and Roger Antony Hodgkins, Enfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 27, 1975, Ser. No. 562,422

Claims priority, application Great Britain, Apr. 1, 1974, 14,283/74

Int. Cl. B65h *19/20*
U.S. Cl. 242—56 R

9 Sheets Drawing. 15 Pages Specification



The knife assembly of a web autowinder comprises a blade mounted in a blade holder; both of these are pivotally supported on the same axis so that the whole assembly can be withdrawn from the web between cuts. The blade is moved by means of a pneumatic cylinder acting via a heavy duty spring which moves the blade when the web is cut. The blade holder is spring loaded towards the web but it is normally held back by the blade. The assembly operates as follows, the admission of low pressure air into the cylinder moves the blade towards the web and the holder follows under the action of its spring. This motion continues until the holder is arrested by a stop and the blade by a pawl. The admission of high pressure air to the cylinder cocks the heavy duty spring and subsequent release of the pawl allows this spring to impel the blade against the web and cut it. Preferably air is blown through the blade holder so that it acts as an air bearing.

T946,009

POLYESTER COMPOSITION

Clive Percy Smith, Wheathampstead, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 14, 1975, Ser. No. 568,132

Claims priority, application Great Britain, May 6, 1974, 19,810/74

Int. Cl. C08k *3/22*
U.S. Cl. 260—40 R

No Drawing. 11 Pages Specification

Fire retardant thermoplastic polyester compositions are prepared by polymerization in the solid phase at a temperature below the melting point of the polyester to increase its molecular weight. The process provides for effective incorporation of fire retardant materials into the polyester composition without substantial degradation of the polyester and loss in molecular weight.

The process of increasing the molecular weight of a thermoplastic polyester includes the steps of heating at a temperature from 5° C. to 70° C., preferably 10° C. to 50° C., below the melting point of the polyester, an intimate mixture of the thermoplastic polyester, such as poly(tetramethylene terephthalate), and from 0.5% to 10% by weight of the polyester of an oxide of a Group *Vb* metal, such as antimony trioxide. Optionally, halogenated aromatic compounds like decarbromodiphenyl ether are also included, in the weight ratio of halogen compound to oxide of between 0.5:1 and 4:1. The amount of fire retardant material or materials added to the polyester to render the composition non-burning depends upon the efficiency of the additive; generally from 5–15% by weight of the polyester is normally effective.

T946,010

PROCESS FOR A ROASTED AND GROUND COFFEE PRODUCT

Arthur Stefanucci, 119 Merrill Road, Clifton, N.J. 07011; Douglas Robert Harnisch, 5800 Arlington Ave., Riverdale, N.Y. 10471; George William Stevens, 54 Cherokee Ave., Allendale, N.J. 07401; and Joseph Francis Coogan III, 320 S. Broadway, Tarrytown, N.Y. 10591

Continuation of abandoned application Ser. No. 432,383, Jan. 10, 1974. This application May 2, 1975, Ser. No. 574,193

Int. Cl. A23f *1/06*; A23l *3/36*; B02c *23/18*
U.S. Cl. 426—418

No Drawing. 5 Pages Specification

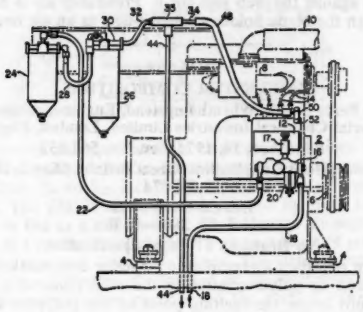
Roasted and ground coffee products having improved freshness are prepared by maintaining the coffee material after roasting and until packaging under conditions of low oxygen and moisture contact. The beans are maintained at reduced temperatures during grinding by means of direct contact with liquid nitrogen. The package roasted and ground product has improved freshness both in terms of shelf-like stability and in-use freshness.

T946,011
FUEL/AIR SEPARATION SYSTEM FOR DIESEL ENGINES

Harold E. McClure, Wayzata, and Floyd D. Leinum, Bloomington, Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Continuation of application Ser. No. 476,176, June 3, 1974, which is a continuation of application Ser. No. 338,704, Mar. 7, 1973, both now abandoned. This application May 7, 1975, Ser. No. 575,287

Int. Cl. F02m *37/00*
U.S. Cl. 137—565
1 Sheet Drawing. 9 Pages Specification



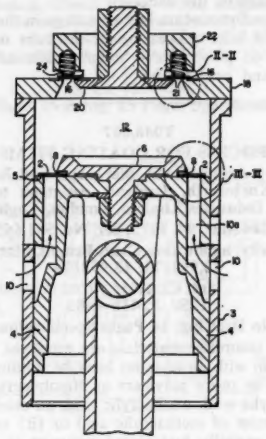
This invention relates to apparatus for removing gas from a diesel engine liquid fuel system. The apparatus includes a fluid conduit connected at one end to a fuel injection pump by means of a downwardly sloping confined fluid path and at the other end to a source of fuel in a closed fluid circuit. The fluid conduit includes both an inner tube member, which is adapted to convey portions of a fluid and gas mixture from the fuel source for transfer through the sloping tube to the injection pump, and an outer tube member, which is connected to the circuit and arranged concentrically with respect to the inner tube member and spaced therefrom. Gas that has accumulated in the receiver of the injection pump and sloping fluid path prior to starting the engine may travel up the sloping fluid path in a counter-current direction to the fluid flow and through portions of the space formed between the concentric tube members so as to escape back through the fluid circuit into the air space above the fuel in the fuel tank during filling of the fluid path with fuel when starting the diesel engine.

T946,012
GAS COMPRESSOR VALVE ARRANGEMENT WITH IMPROVED WEAR RESISTANCE

Leonard L. Willis, Minneapolis, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Continuation of abandoned application Ser. No. 469,589, May 13, 1974. This application May 7, 1975, Ser. No. 575,291

Int. Cl. F04b *39/10*
U.S. Cl. 417—550
1 Sheet Drawing. 6 Pages Specification



This invention relates to improving the active life and wear resistance of suction and exhaust valves used in the gas compressor for a refrigerator system. To reduce excessive valve wear caused by either dynamic impact of opposing valve surfaces or from the corrosive nature of the compressed fluid and to eliminate valve chatter, the valve seat, all the surfaces of the valve, and the valve stop are coated with an anti-friction, resilient Teflon material. By providing a Teflon to Teflon surface rather than a metal to metal or metal to Teflon surface, the energy from the valve impact at its stop or seat can be partially absorbed to thereby substantially decrease rebound from the stops and reduce wear due to both impact and friction so as to increase the life of the valve over that of conventional valve assemblies.

REISSUES

MAY 4, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

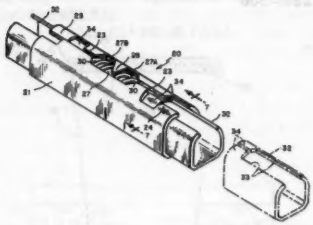
Re. 28,793
END ATTACHMENT FOR WATCH BAND AND SELF-CONTAINED COMPONENT FOR USE IN MAKING THE SAME

Stephen F. Bert, West Warwick, R.I., assignor to Textron Inc., Providence, R.I.

Original No. 3,897,612, dated Aug. 5, 1975, Ser. No. 491,141, July 25, 1974. Application for reissue Aug. 18, 1975, Ser. No. 605,288

Int. Cl.² A44C *5/18*

U.S. Cl. 24—265 B 13 Claims



8. A self-contained component for making an end attachment for watch bands adapted to be mounted between spaced lugs of a wrist watch comprising

a generally tubular member formed from a strip of metal,

a pair of tabs, one adjacent to one end of said strip and the other adjacent to the other end thereof, the ends of said tabs being bendable towards the interior of said tubular member,

coiled compression spring means within said tubular member, [and]

a pair of *hollow* generally tubular inserts adapted to slide within said generally tubular member, each insert being formed from a strip of metal and each insert having a generally rectangular slot formed between the edges of said strip which has an open end and an inner end formed by the edges of a pair of tabs which extend inwardly towards each other from the adjacent ends of said strip, *and the outer surface of said self-contained component being devoid of any lateral projection*

whereby said component can be assembled by an automatic machine which inserts said coiled compression spring means into said tubular member and then simultaneously inserts said *hollow* inserts at opposite ends of said tubular member with the open ends of their rectangular slots pointing outwardly and moves them inwardly compressing said spring means until the inner ends of said rectangular slots pass beyond said tabs of the generally tubular member and then bends the ends of said tabs into said longitudinal slots, whereby the inner edges of said tabs of the generally tubular member engage the edges of said tabs which form the inner ends of the rectangular slots of the inserts, thereby to stop outward movements of said inserts by said coiled springs.

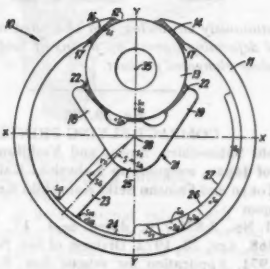
Re. 28,794
BALANCE WHEEL

Wilhelm Tilse, Pforzheim-Birkenfeld, Germany, assignor to Timex Corporation, Waterbury, Conn.

Original No. 3,851,461, dated Dec. 3, 1974, Ser. No. 317,850, Dec. 22, 1972. Continuation of Ser. No. 114,277, Feb. 10, 1971, abandoned. Application for reissue Apr. 14, 1975, Ser. No. 568,217

Int. Cl.² G04C *3/04;* G04B *17/00;* H02K *33/00*

U.S. Cl. 58—107 5 Claims



1. A balance wheel comprising:

a balance body having an axis, a counterweight portion and at least one element subject to weight variations mounted on the other side of said axis from said counterweight portion to cause rotation of the body through an angle when the axis is horizontal and the wheel is not properly poised,

said counterweight portion being tapered in a peripheral direction so that said angle is determined by the amount of dispoise, and also varying in distance from said axis in a predetermined manner to facilitate removal of greater predetermined sections of said counterweight portion for correction of correspondingly [lesser] *greater* amounts of dispoise.

Re. 28,795
APPARATUS AND METHOD FOR CONTINUOUS EXTRUSION

Francis Joseph Fuchs, Jr., Princeton, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Original No. 3,740,985, dated June 26, 1973, Ser. No. 199,542, Nov. 17, 1971. Application for reissue Jan. 4, 1974, Ser. No. 430,984

Int. Cl.² B21C *33/00*

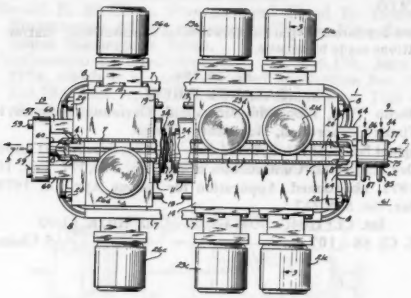
U.S. Cl. 72—60 97 Claims

83. Method for continuously deforming an elongated workpiece of indefinite length to produce an elongated product of indefinite length, said method comprising:

a. continuously moving a motive means around an endless path, said path including a first station upstream of a deforming agency and a second station downstream of said deforming agency, the direction of travel of said motive means around said endless path being from said first station toward said second station;

b. continuously placing successive portions of said motive means between said first station and said deforming agency in operative engagement with the elongated surface of said elongated workpiece thereby to continuously apply motive force along the elongated surface of said elongated work-

piece in the direction of said deforming agency;



c. continuously advancing said elongated workpiece against said deforming agency by means of said motive force to produce elongated product.

Re. 28,796

COMPACT FLYING PRINTER

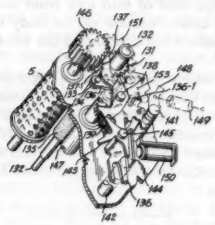
Takayoshi Shimodaira, Suwa, and Yoshifumi Gomi, Chino, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Suwa, both of, Japan

Original No. 3,835,770, dated Sept. 17, 1974, Ser. No. 248,368, Apr. 28, 1972. Division of Ser. No. 118,427, Feb. 24, 1971. Application for reissue Apr. 9, 1975, Ser. No. 566,492

Claims priority, application Japan, Feb. 27, 1970, 45-16451

Int. Cl.[2] B41J *27/00*

U.S. Cl. 101—93.31 **11 Claims**



1. In a printing device having printing means, drive means for said printing means and means for incrementally, longitudinally advancing paper relative to said printing means, the improvement in said paper advancing means which comprises a continuously rotating member driven by said drive means; a transmitting member displaceable between a first rest position and a second position; first coupling means operatively engaging said transmitting member and said rotating member for the selective displacement of said transmitting member between said first and second positions in response to the rotation of said rotating member, said first coupling means including a first lever mounted on said transmitting member for pivotable displacement into and out of operative engagement with said rotating member; a first spring means biasing said first lever into said operative engagement; first detent means mounted on said transmitting means for releasably retaining said first lever out of operative engagement with said rotating member; and selective releasing means coupled to said first detent means for selectively releasing said first detent means to permit the displacement of said first lever into operative engagement with said rotating member for the displacement of said transmitting member; second spring means coupled to said transmitting member for the storage of energy during the displacement thereof between said first and second positions; means disengaging said transmitting member and said rotating member at said second position to release said transmitting member for return to said first position in response to the energy stored in said second spring means; paper engaging means for the displacement of said paper; and second coupling means operatively engaging said transmitting means and said paper engaging means during [said] displacement [from said second to said first position] *of said transmitting means* for operative displacement of said paper engaging means.

Re. 28,797

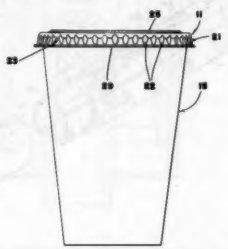
LID

Clarence T. Brewer, Oak Park, Ill., assignor to Solo Cup Company, Urbana, Ill.

Original No. 3,583,596, dated June 8, 1971, Ser. No. 843,671, July 22, 1969. Application for reissue July 30, 1975, Ser. No. 600,413

Int. Cl.[2] B65D *41/16, 41/18*

U.S. Cl. 220—306 **19 Claims**



1. A lid for gripping and sealing engagement with a container having a bead about an upper edge thereof, said lid comprising a central panel, means defining an inwardly opening, circumferentially extending cavity on said lid at a position radially outwardly of said central panel to receive said bead and to abut said bead in sealed engagement, means connecting said cavity to the outer edge of said panel, a conical skirt extending downward and outward from the lower edge of said cavity defining means and terminating a free end having a diameter larger than the diameter of said bead, whereby the upper portion of said skirt and the lower portion of said cavity defining means from a waist, and a series of circumferentially spaced flutes, interrupting said waist, the portions of said skirt between said flutes acting as lands when the lid is telescoped on a container, each of said lands having a decreasing circumferential extent from a lower portion to an inner portion thereof to facilitate flexing of said land radially outward when cammed by the container bead, the lower portion of said cavity defining means being moveable into position beneath said bead to grip the latter when the lid is fitted on said container.

Re. 28,798

METHODS OF AND APPARATUS FOR ALIGNING AND BONDING WORKPIECES

Carl Richard Herring, and Fred John Schneider, both of Allentown, Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Original No. 3,696,985, dated Oct. 10, 1972, Ser. No. 889,447, Dec. 31, 1969. Application for reissue Sept. 14, 1973, Ser. No. 397,215

Int. Cl.[2] B23K *1/00*

U.S. Cl. 228—5.5 **28 Claims**

1. In a method of compliant bonding wherein metal-to-metal bonding of a first workpiece to a second workpiece is

accomplished by the steps of clamping said workpieces together around the desired bond region between a support and a deformable compliant member, said member being capable of deformation around one of said workpieces, and applying sufficient thermal and/or mechanical bonding energy to said bond region to deform said member around said one workpiece and bond said workpiece, the improvement which comprises the steps of:

providing that said compliant member is transparent, and

viewing the workpieces through said transparent compliant member while aligning said workpieces to each other whereby said alignment is facilitated.

Re. 28,799

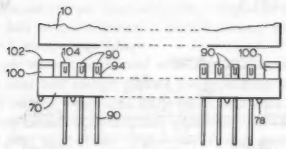
MOUNTING BRACKET FOR DISPLAY PANEL

William M. Hennessey, Somerville, and Hector R. Schorno, Rockaway, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Original No. 3,772,634, dated Nov. 13, 1973, Ser. No. 253,350, May 15, 1972. Application for reissue July 12, 1974, Ser. No. 487,932

Int. Cl.[2] H01R *13/62*

U.S. Cl. 339—65 **21 Claims**



26. A mounting bracket for a thin, flat display panel having spaced-apart top and bottom plates which carry electrical contacts along adjacent aligned edges thereof, said bracket comprising

an elongated insulating base member having a series of apertures formed along its length and having a top surface and a bottom surface,

a flexible electrical connector secured to each of a plurality of said apertures and having first portions which project to substantially the same height above said top surface of said base member for insertion into said panel, and second portions which project beneath the lower surface of said base member for insertion into a printed circuit board of the like,

a rigid panel guide member inserted in at least two of said apertures, each said guide member extending above said connectors and positioned to engage said panel first, before said connectors engage said panel when a panel is brought into engagement with said base member,

said connectors and said guide members being oriented along a common axis for insertion into the space between said top and bottom plates of said panel,

at least one upright support member secured to said base member transverse to said axis whereby the bottom plate of said panel can rest on and be supported by said support member when said display panel is carried by said bracket, and

a pivotable clamping member pivotally coupled to said upright member and adapted to engage and clamp to an edge of said panel.

Re. 28,800

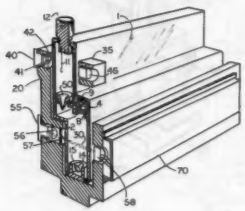
APPARATUS FOR EVALUATION OF BIOLOGICAL FLUID

Jesse L. Acker, Rockaway, and Peter M. Meserol, Boonton Township, both of N.J., assignors to Akro-Medic Engineering, Inc., Denville, N.J.

Original No. 3,837,745, dated Sept. 24, 1974, Ser. No. 290,654, Sept. 20, 1972. Application for reissue Apr. 16, 1975, Ser. No. 568,394

Int. Cl.[2] G01N *21/24*

U.S. Cl. 356—201 **15 Claims**



1. An apparatus which comprises:

a. a plurality of [stationary] cuvettes,

b. a chamber for fluid,

c. a plurality of unidirectional valves each of which is mounted between said chamber and each of said cuvettes for placing said chamber in fluid communication with each of said cuvettes and for permitting flow of fluid from said chamber into each of said cuvettes,

d. a plurality of optical transmitting means in registration with each of said cuvettes for transmitting a beam of radiant energy through each of said cuvettes,

e. detector means for intercepting each of said beams of radiant energy passing through the fluid in each of said cuvettes,

f. pneumatic valve means operably connected between said chamber for fluid and said detector means for causing a pressure differential between said chamber and each of said cuvettes in response to a signal from said detector means for permitting flow of fluid from said chamber to each of said plurality of cuvettes, and

g. gas permeable means in gaseous fluid communication with each of said cuvettes to permit gas present in said cuvettes to escape from said cuvettes when said unidirectional valves are open and to ease the flow of fluid from said chamber to each of said plurality of cuvettes.

Re. 28,801

APPARATUS FOR EVALUATION OF BIOLOGICAL FLUID

Jesse L. Acker, Rockaway, and Peter M. Meserol, Boonton Township, both of N.J., assignors to Akro-Medic Engineering, Inc., Denville, N.J.

Original No. 3,837,746, dated Sept. 24, 1974, Ser. No. 392,107, Aug. 27, 1973. Continuation-in-part of Ser. No. 290,654, Sept. 20, 1972. Application for reissue Apr. 16, 1975, Ser. No. 568,442

Int. Cl.[2] G01N *21/24*

U.S. Cl. 356—201 **12 Claims**

3. An apparatus which comprises:

a. a plurality of cuvettes,

b. a chamber for fluid,

c. means for placing said chamber in fluid communication with each of said cuvettes and permitting flow of fluid from said chamber into each of said cuvettes,

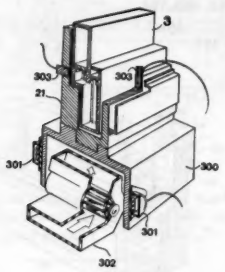
d. a permeable membrane mounted between the floor of said chamber and said cuvettes,

e. a gas permeable means in gaseous-fluid communication with each of said cuvettes to permit gas present in said

cuvettes to escape from said cuvettes when said fluid passes from said chamber into said cuvettes,

f. a plurality of optical transmitting means each of which is in registration with a corresponding cuvette for transmitting a beam of radiant energy through said cuvette,

g. detector means for intercepting each of said beams of radiant energy and for measuring any optical change in said



radiant energy passing through the fluid in each of said cuvettes,

h. means for imposing pressure differential between said chamber and said cuvettes to permit flow of fluid from said chamber through said permeable membrane into said cuvettes, and

i. temperature control means to maintain the temperature of said fluid substantially constant.

Re. 28,802

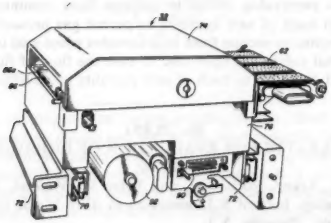
FUSING APPARATUS

Vaidevutis C. Draugelis; George N. Tsilibes, and John E. Vineski, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original No. 3,826,892, dated July 30, 1974, Ser. No. 300,531, Oct. 25, 1972. Application for reissue Oct. 3, 1974, Ser. No. 511,880

Int. Cl.[2] H05B *1/00*

U.S. Cl. 219—216 **10 Claims**



2. [A printing machine as recited in claim **1**, further including:] *An electrophotographic printing machine of the type having a powder pattern formed on a sheet of support material, wherein the improvement includes:*

means for transporting the sheet of support material with the powder image deposited on one surface thereof along a path of movement, said transport means being arranged to be in substantial contact with the other surface of the sheet of support material;

means for heating said transport means;

a radiant energy source having at least one heat strip arranged to be in thermal communication with the sheet of support material for supplying the energy output thereof onto the sheet of support material being moved with the powder pattern thereon by said transport means along the path of movement coalescing and affixing substantially permanently the powder pattern to the sheet of support material;

first control means arranged to actuate said heating means in response to the printing machine being energized for rapidly heating and regulating said transport means at about a standby temperature; and

second control means arranged to actuate said radiant energy source, in response to the printing machine being energized, for rapidly heating said transport means to about the standby temperature; and deactuating said radiant energy source at about the standby temperature, said second control means, responsive to the sheet of support material being positioned on said transport means, for regulating said radiant energy source about a predetermined temperature at a lower power level and below the predetermined temperature at a higher power level.

Re. 28,803

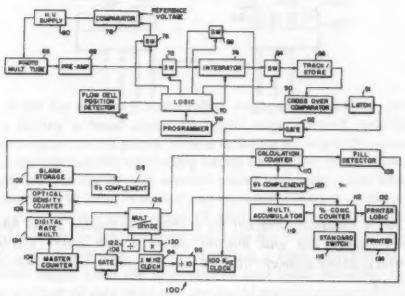
METHOD AND ELECTRONIC CONTROL FOR THE ANALYZATION OF SERUM CHEMISTRIES

Larry George Durkos, Indianapolis; Robert Wayne Cole, Zionsville, and Jerry William Denney, Carmel, all of Ind., assignors to American Monitor Corporation, Indianapolis, Ind.

Original No. 3,742,196, dated June 26, 1973, Ser. No. 179,135, Sept. 9, 1971. Application for reissue Jan. 16, 1975, Ser. No. 541,377

Int. Cl.[2] G06F *15/42*

U.S. Cl. 235—151.3 **36 Claims**



1. An apparatus for determining the concentration of [an element] *a substance* in a *test* solution, which comprises analyzation means for determining the light transmittance of [a] *the* solution and for generating a first analog signal in accordance therewith; said analyzation means being [adaptable for determining the light transmittance of a reference substance and] *also* for generating a [second] *reference* analog signal [in accordance therewith] ; conversion means for generating a first digital signal from said first and [second] *reference* analog signals, said first digital signal having a first numerical value associated therewith [as] representative of the optical density of said solution; and calculation means for calculating the [percentage] concentration of the [element] *substance* in said solution from said first digital signal, said calculation means [including] *having* generation means for generating and storing a second digital signal having a second numerical value associated therewith representative of [the concentration of the element needed in said solution for said first numerical value to equal one;] *a standardizing scale factor value*, a digital pulse generator for generating a first digital pulse train having pulses occurring at a predeterminable frequency and having first and second outputs [;] , frequency alteration means coupled to said conversion means and said first *pulse* generator output for altering said fre-

quency in accordance with said first digital signal whereby a second digital pulse train is generated [;], first counting means coupled to said second *pulse* generator output for counting the pulses occurring in said first pulse train [;], second counting means coupled to said frequency alteration means for counting the number of pulses occurring in said second pulse train [;], detection means for detecting when the number of said first pulse train pulses counted by said first counting means equals said second numerical value and for inhibiting said digital pulse generator when the equation occurs, whereby the number of pulses counted by said second counting means prior to the inhibiting of said generator represents the numerical value of the concentration of the [element] *substance* in said [first] solution.

Re. 28,804

SEAT BELT SYSTEM FOR AUTOMOTIVE VEHICLES

Vincent Sardo, Jr., 220 W. Skyline Drive, Ringwood, N.J. 07456

Original No. 3,748,640, dated July 24, 1973, Ser. No. 210,327, Dec. 21, 1971. Application for reissue May 24, 1974, Ser. No. 473,077

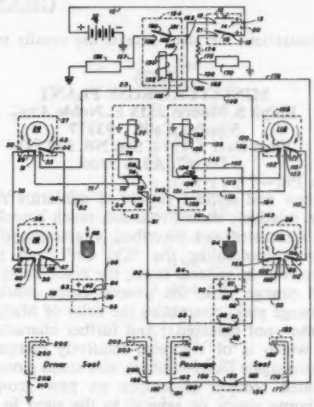
Int. Cl.[2] B60Q 1/00; B60R 21/10

U.S. Cl. 340—52 E **10 Claims**

9. A control and indicator system for use with a motor vehicle provided with a source of direct current, a starter circuit, an ignition circuit, an ignition switch actuable from a normally open position to a START position connecting said source to said starter circuit and said ignition circuit and biased to return from said START position to a RUN position connecting said source to said ignition circuit, seat occupancy responsive switch means and seat belt in-use responsive switch means, said control and indicator system comprising:

first logic means connected with said seat switch means and said seat belt switch means for producing a START logic level output when and only when said seat occupancy responsive switch means are actuated prior to actuation of said seat belt in-use responsive switch means, said logic means producing a START logic level output when said seat belt in-use responsive switch means are deactuated or when said seat occupancy responsive switch means are deactuated,

second logic means connected with said first logic means and said starter and ignition circuit for producing a START logic level output in response to actuation of said ignition switch to said START position subsequent to production of said START logic level output from said first logic means,



third logic means for controlling energization of said starter circuit and permitting energization of said starter circuit only in response to said START logic level output of said second logic means,

visual indicator means,

audible indicator means,

fourth logic means responsive to the output of said first logic means for energizing said indicator means in response to said START logic level output of said first logic means.

PLANT PATENTS

GRANTED MAY 4, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,876
MINIATURE ROSE PLANT
Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277
Filed Dec. 9, 1974, Ser. No. 530,724
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, relatively dwarf, rounded, much branched, bush type, as illustrated and described, characterized by buds and flowers resembling the "Cri Cri" (not patented) miniature rose in general form, the color being a bright shade of orange pink, the general color effect being a bright orange pink, resembling the color of Margo Koster (*polyantha*—not patented); and further characterized by a plant which is of vigorous, relatively compact habit, easy to propagate from cuttings; with small glossy foliage, often tinted reddish or bronze on new growth; with flowers borne singly or several to the stem in spray or cluster.

3,877
HICAN TREE
George James, Brunswick, Mo., assignor to James Pecan Farms, Inc., Brunswick, Mo.
Filed Apr. 8, 1975, Ser. No. 566,070
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of hican tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of bark on the tree trunk which is typical of pecan tree bark; branches and foliage which are typical of those of hickories; a self-fertile and relatively heavy nut bearing habit, with the nuts being borne in clusters of usually 3 to 5 nuts per cluster; a nut shape generally similar to that of pecan nuts, but the nuts being much larger than the nuts of northern pecans and having rough and much thinner shells which resemble hickory nuts, with the nut shells being heavier than those of pecans, and the nuts averaging 42 in number per pound; a high cracking percentage of 52%, with the ability of being cracked readily by regular conventional pecan cracking machinery, and the kernels being plump and solid and releasing easily and mostly in halves; an excellent kernel flavor which is distinctly similar to the typical flavor of hickories; the production of attractive catkins which range between 8 and 12 inches in length but which are smaller in diameter than those of either pecans or hickories, and the catkins being light green in color; an early nut maturity usually occurring about September first in Missouri, which enables extension of the commercial growing of the nuts to states both east and north of Missouri and to ayn other places where hickory nuts are now grown; and excellent hardiness.

3,878
VARIETY OF APPLES
Edwin Saels, 310 Pastorijstraat, 3910 Donk, Herk-de-Stad, Belgium
Filed Oct. 23, 1973, Ser. No. 408,463
Claims priority, application Belgium, Oct. 20, 1972, 790,344
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple tree characterized in that the mother tree derives, by natural mutation, from a young shoot growing in a row of low-stem Golden Delicious apple trees and in that grafts from the mother tree have been grafted on Paradis E.M. type 9 apple trees, and further characterized by the following morphological and physiological properties: The tree has the appearance of the Golden Delicious and requires the same care with regard to pruning, watering and fertilizing, is very productive with many fruit branches and buds, and is suitable for massive plantation for industrial production, the apple is conic-oblate, similar to the Belle de Boskoop or Reinette with a sunken head, its lower portion and its tail are those of a Golden Delicious, its very appealing color goes from the salmon red to slightly yellow green of the Golden Delicious, its pulp is very firm, white, crisp and juicy, its peel is very fine, its taste is fresh, aromatic and sour-sweet, it is particularly suitable for making juice of a real apple taste and for making very fine sauces, it withstands transportation very well and keeps under normal refrigeration until May 15th and longer under special conditions.

3,879
XYLOSMA PLANT
Folke S. Olsson, Laguna Niguel, Calif. (2154 Peck Road, Monrovia, Calif. 91016)
Filed July 26, 1974, Ser. No. 492,239
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of the Xylosma genus as described and illustrated, characterized particularly by its hardier more compact growth, its smaller leaves, and the more distinctive margins of its juvenile leaves; all as compared with the *Xylosma senticosa.*

3,880
KALANCHOE PLANT
Norbert Bull, Gonnebek, Germany, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Dec. 20, 1974, Ser. No. 535,087
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of kalanchoe characterized particularly by its excellent self-branching, numerous umbels on strong stems, relatively large red flowers, strong growth habit, and by its excellent keeping and shipping qualities.

PATENTS

GRANTED MAY 4, 1976

ERRATA

For CLASS	See PATENT NO.
108-057	3,954,067
197-165	3,954,167
424-330	3,954,227
308-216	3,954,313
096-122	3,954,481
526-350	3,954,697
526-079	3,954,698
526-308	3,954,699
526-179	3,954,700
526-075	3,954,720
526-014	3,954,721
526-068	3,954,722
240-007 ILJ	3,955,173

PATENTS

GRANTED MAY 4, 1976

GENERAL AND MECHANICAL

3,953,892
SAFETY SWIM CAP
James R. Kennedy, and Carole Joy Kennedy, both of 999 NE. 23rd Drive, Fort Lauderdale, Fla. 33305
Filed Mar. 4, 1975, Ser. No. 555,154
Int. Cl.[2] A42B *1/08*
U.S. Cl. 2—3 R **1 Claim**

1. A safety swim cap to be worn on the head of a swimmer for providing both protection and readily seen identification of the swimmer, such as when participating in water sports, the safety swim cap comprising, in combination:

a first endless oblong ring-shaped inflatable tube member having a hollow passageway extending completely therethrough, said first tube member being of a circular ring shape having a size and configuration to be positioned on an individual's head to encircle the head about the forehead and back portion of the wearer's head, said first tube member having a front portion, a back portion, and opposed side portions positioned for engaging the wearer's forehead, the wearer's back head portion, and the opposed sides of the wearer's head respectively;

a second elongated hollow resilient inflatable tube member disposed in a semi-circular configuration extending above the plane of said first tube member normal thereto and having one end connected to said front portion of said first tube member with the opposite end connected diametrically opposite the front end to said back portion of said first tube member, said second tube member having a hollow passageway in communication with said first tube member hollow passageway;

a third elongated hollow resilient inflatable tube member disposed in a semi-circular configuration extending above the plane of said first tube member normal thereto and spaced ninety degrees from said second tube member with the opposite ends of said third tube member joined to the approximate mid-points of said first tube member at the diametrically opposed side portions thereof, said third tube member having a hollow passageway in communication with said first tube member passageway and said second tube member passageway;

said second tube member and said third tube member intersecting at their point of crossing and joined together thereat centrally above said first tube member in alignment with the axis of the ring defined by said first tube member and with their respective hollow passageways in communication at the point of joining;

a pair of chin straps each extending downwardly from said first tube member to be passed beneath the chin of the wearer of the safety swim cap;

each of said chin straps consisting of a flat elongated rectangularly shaped strip of resilient material with each strap having a top end and a bottom end, the top ends of each strap affixed to diametrically opposed side portions of said first tube member with the bottom ends of each strap extending downwardly therefrom in a direction opposed to the upward projection of said second and said third tube members;

a series of longitudinally aligned and equally spaced apart openings disposed along the bottom end portion of one of said chin straps;

a rectangular frame shaped buckle having a hinged tongue member swingably associated with a bottom end thereof and with said bottom end of said frame being pivotally secured to the bottom end portion of the opposite chin strap for selectively receiving therethrough said bottom end portion of said first mentioned chin strap with said opening therein being brought into selective registration with said buckle tongue member for temporary retainment therewith to secure the safety swim cap in a secure and comfortable manner about the head of the wearer;

an elongated cylindrically shaped hollow valve body member disposed centrally of said juncture point between said second and said third tube members with said valve body member projecting vertically upwardly therefrom in a direction normal to the plane of said first tube member;

a hollow open ended passageway extending completely through said valve body member in communication with the atmosphere at one end and in communication with said tube member passageways at the opposite end, said passageway providing for the insertion and removal of air from said tube passageways through said valve body member for the selective inflation and deflation of said tube members;

a flat circularly shaped disc member having a diameter at last equal to the exterior diameter of said valve body member, said disc member having a flat top surface and a flat bottom surface;

an elongated cylindrically shaped resilient shaft having one end thereof disposed centrally of and affixed to said disc member bottom surface with the opposite end thereof extending outwardly therefrom in a direction normal thereto, the shaft being removably insertable into said valve body member passageway;

a multitude of longitudinally spaced apart parallelly disposed annular grooves each being identical to each other and extending along the complete length of said shaft and defining therebetween a plurality of spaced apart parallelly disposed annular ridges each identical to each other with each having identically tapered side walls, said ridges being of a diameter to resiliently engage the interior wall surfaces of said valve body member passageway for resiliently retaining said shaft in position therein with said disc member disposed in engagement with the open top end of said valve passageway for closing the same when said shaft is in position therein for retaining said tube member in an inflated condition;

said tube members and said chin straps each being manufactured of a flexible vinyl material; and

said tube members and said chin straps being of a fluorescent color for safety recognition and identification of a swimmer when in the water and swimming to provide increased visibility of the swimmer's position to others in the water.

3,953,893

PROTECTIVE APRON FOR USE IN MEAT PROCESSING PLANTS

Robert M. Byrnes, Sr., P.O. Box 11218, Aames Ave. Station, Omaha, Nebr. 68111

Division of Ser. No. 469,863, May 13, 1974, Pat. No. 3,883,898. This application Feb. 24, 1975, Ser. No. 552,066
Int. Cl.² A41D 13/04
U.S. Cl. 2—51 2 Claims

1. An apron for use by an operaator in a meat processing plant who uses a knife during various meat cutting procedures in which the knife is manipulated adjacent to and in facing relation to the frontal surface area of the person using the knife, said apron covering the frontal surface area and being constructed of a flexible fabric of non-metallic aramid fiber, such as "Kevlar", said apron being substantially impenetrable by the knife edge thereby protecting the wearer from accidental injury due to cutting when manipulating the knife.

3,953,894

REVERSIBLE NECKTIE AND METHOD OF PRODUCTION

Richard M. Aron, 31 Caprice Drive, Stamford, Conn. 06902

Filed June 25, 1975, Ser. No. 590,262
Int. Cl.² A43D 25/06
U.S. Cl. 2—146 4 Claims

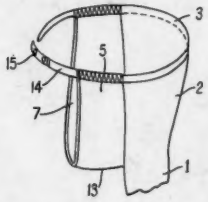
1. A two-faced necktie comprising two coincident face layers; a liner secured throughout its length and width to the back of one of the face layers inwardly of the marginal edges thereof, said liner being substantially coextensive in length with the major portion of the necktie and a line of stitching securing the two face layers together along the lateral edges thereof, the line of stitching closely following the periphery of the liner and uniformly spaced therefrom, except at one side of the neckband portion of the necktie, the liner being coextensive in width with said one face layer only between the lateral stitch lines and slightly inwardly thereof.

3,953,895

HOSIERY FOR WEAR

Leonard Cecil Lowth, London, England, assignor to Scholl, Inc., Chicago, Ill.

Filed July 3, 1974, Ser. No. 485,745
Claims priority, application United Kingdom, July 4, 1973, 31863/73
Int. Cl.² A41B 9/04
U.S. Cl. 2—240 4 Claims



1. An article of wearing apparel comprising a leg portion shaped substantially to cover at least the upper part of one of a wearer's legs and an upper outside body portion extending upwardly from the leg portion at least to waist height for engaging the wearer's thigh in line with said one leg, and comprising:

a substantial width crotch strip connected along the inner side of said outside body portion and extending down from the waistline at the front of the article and then providing a crotch-covering loop and extending up to the waistline at the back of the article;

said crotch strip defining a complete opening extending from the waistline to the crotch at its side which is opposite from said upper outside body portion;

whereby when the article is worn on one of the wearer's legs and associated hip, the remaining leg and the hip will remain free until a second counterpart garment is donned on said other leg and provides a thigh covering body portion for said other hip;

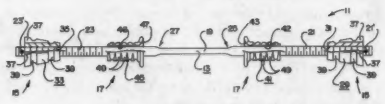
and a waistband extending entirely around the waistline to which said outside body portion and said crotch strip are attached.

3,953,896

PROSTHETIC LIGAMENT

James T. Treace, Malibu, Calif., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.

Filed Sept. 6, 1974, Ser. No. 503,990
Int. Cl.² A61F 1/24
U.S. Cl. 3—1 16 Claims



1. A prosthetic ligament for replacing a natural ligament flexibly connecting first and second natural skeletal members together, said prosthetic ligament comprising:

a. bridge means for joining the first and second skeletal members together, said bridge means including a first end portion for being secured to the first skeletal member and including a second end portion for being secured to the second skeletal member, said bridge means including a flexible central portion for allowing flexure of the first and second skeletal members relative to one another;

b. keeper means for securing said bridge means to the first and second skeletal members thereby connecting the first and second skeletal members together, said keeper means

including a first fastening member for securing said first end portion of said bridge means to the first skeletal member and including a second fastening member for securing said second end portion of said bridge means to the second skeletal member, at least said first fastening member being adjustable in a direction longitudinally of said bridge means, and

c. bushing means for positioning adjacent the first and second skeletal members to protect said bridge means from abrasion as the first and second skeletal members flex relative to each other.

3,953,897

VESICAL PROSTHESIS

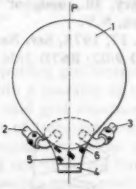
Jacques Chevallet, Nogent-sur-Marne, and Andre Sausse, Sceaux, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Dec. 27, 1974, Ser. No. 536,795

Claims priority, application France, Dec. 28, 1973, 73.46764

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1 **11 Claims**



1. An implantable vesical prosthesis for a bladder, comprising a sterile pouch formed of flexible plastics material compatible with the organisms surrounding a natural bladder, at least a portion of the pouch being deformable during the introduction and discharge of urine, between two extreme positions one corresponding to the full pouch and one to the empty pouch, two inlet pipes opening into the interior of said pouch at inlet orifices and connectable to the two ureters of a patient, an outlet pipe connectable to a urethra of a patient the prosthesis being devoid of any internal artificial valve or flap.

3,953,898

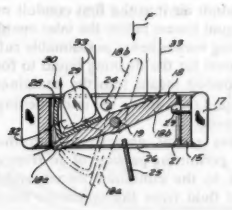
PROSTHETIC ONE-WAY HEART VALVE

Eric Bloch, 556 W. 141st St., New York, N.Y. 10031

Filed June 6, 1975, Ser. No. 584,435

Int. Cl.² A61F *1/22*

U.S. Cl. 3—1.5 **16 Claims**



1. A prosthetic one-way heart valve comprising:

a generally annular valve body having a central opening defining a blood flow passageway,

a disc within said valve body and having a periphery substantially complementary to the periphery of said opening,

means supporting said disc for pivotal movement with respect to said body about an axis extending substantially along a centerline of said disc,

vane means projecting from one face of said disc in a direction opposite to the flow direction through the valve, said vane means being responsive to fluid flow in the flow direction of the valve for causing said disc to pivot to a position in which the valve is open, and

baffle means carried by said valve body adjacent to the face of said disc opposite the face from which said vane means project, said baffle means extending across said opening and being arranged to direct fluid flowing in the no-flow direction of said valve against the portion of said disc which moves toward the flow direction when the valve opens, thereby pivoting said disc to a position in which the valve is closed.

3,953,899

KNEE ARTHROPLASTY

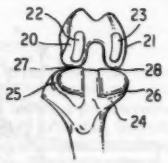
John Charnley, Knutsford, England, assignor to Chas. F. Thackray Limited, England

Filed Apr. 16, 1974, Ser. No. 461,346

Claims priority, application United Kingdom, May 17, 1973, 23493/73

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.911 **13 Claims**



9. A knee arthroplasty comprising a femoral portion and a tibial portion, the femoral portion comprising two femoral implants each being designed for implantation into one of the femoral condyles and having a bearing surface shaped as a segment of a right circular cylinder, and the tibial portion being designed for implantation into the upper end of the tibia and presenting, for each femoral implant, a plane upper surface on which the bearing surface of the femoral implant will bear, said tibial portion comprising a cap having a semi-circular upper surface, a flange depending from the straight side of the upper surface and a lip turned under and inwardly round the arcuate part of the upper surface.

3,953,900

ARTIFICIAL LIMB WITH THREE-PART COSMETIC COVERING

Herbert Thompson, Harrow, England, assignor to Chas. A. Blatchford & Sons, Ltd., Basingstoke, England

Filed Feb. 25, 1975, Ser. No. 553,009

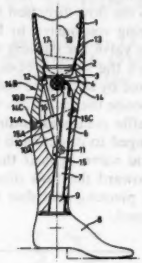
Claims priority, application United Kingdom, Feb. 26, 1974, 8582/74

Int. Cl.² A61F *1/08, 1/06*

U.S. Cl. 3—2 **11 Claims**

1. An artificial leg of the endoskeletal type comprising: - a shin portion; a thigh portion; knee joint structure connecting together the shin portion and the thigh portion; a first tubular cosmetic covering on the shin portion; a second tubular cosmetic covering on the thigh portion; and an intermediate

tubular cosmetic covering over the knee joint structure, the ends of the intermediate covering being in contact with the



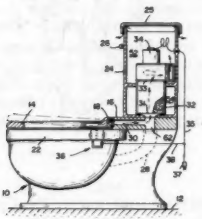
respective adjacent ends of the first and second coverings to avoid gaps between the coverings.

3,953,901

TOILET STOOL VENTILATING MEANS

Clarence E. Poister, Topeka, Kans.; Philip A. Tyrrell, Kansas City, Mo., and Walter D. Hodge, Shawnee Mission, Kans., assignors to PK Products/Inc., Wichita, Kans.

Filed Feb. 11, 1974, Ser. No. 441,452
Int. Cl.[2] E03D 9/04; A47K 13/00
U.S. Cl. 4—213 **4 Claims**



1. An improved toilet stool mounted on a supporting surface and including a generally annular conduit seat having an exit aperture and intake openings in communication with the inside of the toilet bowl, said seat circumscribing the upper rim of said toilet bowl when in a lower position, a tank supported on a rearwardly extending portion of said toilet stool behind said toilet bowl, having a flushing liquid and means connected therein to supply the flushing liquid to the toilet bowl through a discharge conduit, the improvement being:

a. a ventilating means which comprises an adapter plate situated underneath said tank and having said conduit seat pivotally attached thereto and including a structure defining a conduit which is in communication with said exit aperture of said seat, said conduit of said adapter plate having the outlet thereof substantially spaced from said toilet bowl to one side and opening at a point underneath an end portion of said tank,

b. a housed filter element having an outlet, and an inlet, said filter element inlet being communicably connected with said outlet of said conduit of said adapter plate, and

c. means attached to said filter for removing normally contaminated air from the inside of said toilet bowl through said intake openings, said exit aperture, said conduit of said adapter plate, said inlet and said filter element, in order stated, for deodorizing said normally contaminated air and passing it into the surrounding atmosphere,

d. switch means connected to said rim and electrically operably connected to said means for removing such that pressure exerted on the top of said seat operates said switch means to activate said means for removing,

e. said adapter plate is horizontally attached to the rear of said seat and is essentially aligned therewith when said seat is in a lowered position,

f. said filter element inlet being situated immediately contiguous to said inlet of said conduit of said adapter plate and communicably connected therewith,

g. said tanks has a watertight partition uprightly attached to the internal sides of said tanks forming a compartment in said tank with said partition separating said flushing liquid from said compartment, and said tanks having an aperture through the bottom thereof in said compartment at one end portion thereof,

h. said filter element and said means for removing contaminated air being removably lodged within said compartment, and

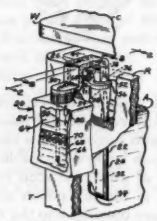
i. said conduit of said adapter plate being communicably connected to said aperture in said tank.

3,953,902

WATER CLOSET ADDITIVE MEANS

Glenn N. Taylor, Cary, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 17, 1975, Ser. No. 541,745
Int. Cl.[2] E03D 9/02; B67D 5/06; B65D 83/06
U.S. Cl. 4—227 **46 Claims**



1. A device for introducing an additive liquid into a water closet of the type having a tank for retaining a flushing liquid which lowers and rises between a first upper level and a second lower level during flushing, comprising:

container means for retaining the additive liquids;

first conduit means communicating between said container means and inlet opening means positionable in said tank intermediate said first and second levels of the flushing liquid to admit air into the first conduit means when the flushing liquid lowers below the inlet opening means, said inlet opening means being positionable sufficiently below said first level for the flushing liquid to force air through the first conduit means into the container means as the flushing liquid rises above the inlet opening means toward said first level;

one-way valve means associated with the first conduit means for permitting passage of air from said inlet opening means to the container means and for preventing passage of fluid from the container means to the inlet opening means; and

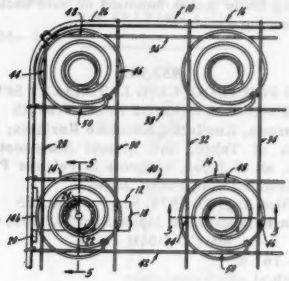
second conduit means communicating between said additive liquid in the container means and outlet opening means positionable in the tank for passage of additive liquid into the flushing liquid, whereby the air forced into the container means forces a portion of the additive liquid from the container means through the second conduit means and outlet opening means into the flushing liquid in said tank.

3,953,903

SPRING UNIT SUPPORT AND ASSEMBLY

James Rogers Lawrence, and Chester R. Yates, both of Carthage, Mo., assignors to Steadley Company, Inc., Carthage, Mo.

Filed Dec. 23, 1974, Ser. No. 535,987
Int. Cl.² A47C 23/02
U.S. Cl. 5—267 13 Claims



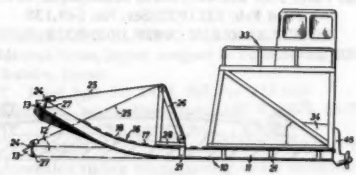
1. A coil spring supporting grid structure adapted for snap-in inter-connection with a plurality of coil springs to form a spring unit assembly, said grid structure comprising a set of longitudinal and a set of transverse wires fixedly joined together at their intersections to define a substantially planar grid, said wires having coil-engaging formations intermediate said intersections extending transversely with respect to said grid plane, with each corresponding pair of coil-engaging formations of adjacent longitudinal wires extendng in one direction with respect to said grid plane, and each corresponding pair of coil-engaging formations of adjacent transverse wires extending in the opposite direction with respect to said grid plane, with the coil-engaging formations of at least one of said sets of wires being adapted to engage the interior of an end convolution of a coil spring, whereby the end convolution of a coil spring may be snapped in place under one corresponding pair of coil-engaging formations and over the other corresponding pair of formations.

3,953,904

DESIGN AND CONSTRUCTION OF HULLS

Jeremy Joseph Fry, Bath, England, assignor to Rotork Marine Limited, Bath, England

Continuation of Ser. No. 342,502, March 19, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,572
Claims priority, application United Kingdom, Mar. 29, 1972, 14821/72
Int. Cl.² B63B 7/06
U.S. Cl. 9—1 R 14 Claims



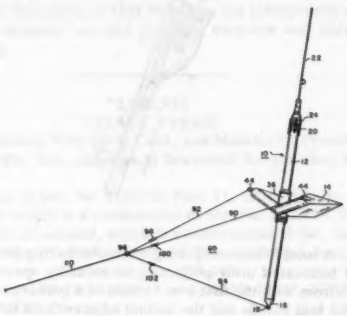
1. A marine craft driven by power means having a hull structure comprising a plurality of separate, elongated, continuous, self-supporting tubes each made of a substantially rigid, but slightly resilient material and extending longitudinally of the hull structure, said tubes being located side by side in substantially the same horizontal plane and being interconnected with adjacent tubes abutting each other, and means for adjustably tensioning the tubes mounted on said hull structure for raising and lowering one of the longitudinal end portions of the tubes so as to impart a predetermined adjustable upward bending and shaping thereto.

3,953,905

STABILIZED, TOWABLE SPAR BUOY

John Lloyd Paitson, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed July 15, 1974, Ser. No. 488,368
Int. Cl.² B63B 21/52
U.S. Cl. 9—8.3 E 9 Claims



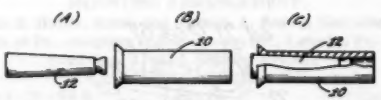
1. A buoy adapted to be towed over the surface of a body of water comprising in combination: a spar, a streamlined, V-shaped wing means having a predetermined positive dihedral being coupled to and extending laterally from said spar, said wing means being positioned on said spar such that its apex is submerged in the body of water to dynamically stabilize said buoy in the pitch, roll and yaw axes while said buoy is under tow, and bridle means coupled to said spar and wing means for adjusting the angle of attack of said wing means with respect to the water surface.

3,953,906

FASTENER ASSEMBLY

Clarence K. Brown, 6219 E. 6th St., Long Beach, Calif. 90814

Continuation of Ser. No. 232,313, March 6, 1972, abandoned, which is a division of Ser. No. 7,167, Feb. 2, 1970, Pat. No. 3,693,247, which is a continuation-in-part of Ser. No. 764,811, Oct. 3, 1968, abandoned. This application Oct. 4, 1974, Ser. No. 512,827
Int. Cl.² B21K 1/60; B23P 11/00
U.S. Cl. 10—27 R 10 Claims



1. A method for forming a fastener assembly, said method comprising the steps of:

providing a sleeve-like member with a tapered internal bore;

inserting a tapered mandrel having a taper generally corresponding to the bore in said sleeve-like member into said sleeve-like member by a predetermined amount to produce an interference press-fit between said mandrel and said sleeve-like member holding them in assembly and

with an end of said mandrel projecting from the end of said sleeve-like member; and

thereafter processing the outer surface of said sleeve-like member to a cylindrical shape of predetermined outer dimension.

3,953,907

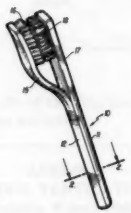
TWIN TOOTHBRUSHES

Camille Henri Froidevaux, P.O. Box 63, Lookout Mountain, Tenn. 37350

Filed Feb. 26, 1975, Ser. No. 553,221

Int. Cl.² A46B 9/04

U.S. Cl. 15—167 A **2 Claims**



1. A toothbrush comprising a handle, having first and second bifurcated arms projecting in mutually spaced relation therefrom with the first arm formed as a planar continuation of the said handle and the second adjacent arm formed at an acute angle to the first arm;

bristles of substantially equal length rigidly fixed to and extending from said arms toward one another to define therebetween a space longer but narrower than the width of a tooth, said space being wider toward the free ends of said arms and narrower toward said handle, whereby the brush may be pushed astride the teeth and thereafter manipulated in vertical strokes to clean them, said handle comprising two parts releasably interconnected to each other by means extending longitudinally along the handle, one of said parts being integral with one of said arms and the other of said parts being integral with the other of said arms, whereby when said parts and said arms integral therewith are disconnected, the first arm and the part integral therewith may be individually used for brushing of the teeth.

3,953,908

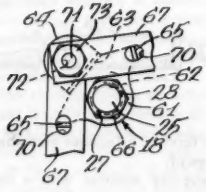
HEADLAMP WIPER ASSEMBLY

Lawrence R. Loskill, Gary, Ind., assignor to The Anderson Company, Gary, Ind.

Filed Apr. 26, 1973, Ser. No. 354,529

Int. Cl.² B60S 1/28

U.S. Cl. 15—250.04 **15 Claims**



1. A wiper assembly comprising a drive shaft, means for oscillating said drive shaft, bracket means having a base portion lying perpendicular to said drive shaft, a mounting tab connected to said base portion and lying parallel to said base portion and being fastened to said drive shaft at least two radially outwardly extending portions of said base portion being positioned in spaced relationship with each other and with said shaft, an upturned leg formed on each outwardly extending portion, a pair of combined wiper arm and backing strip means mounted on said bracket with each said arm and backing strip means projecting radially from said bracket, each said wiper arm and backing strip means being connected to said base portion and to one of said upturned legs, and flexible wiping blade means mounted on said backing strip means for cleaning a surface.

3,953,909

METHOD FOR PRODUCING LATERALLY SPREAD RETICULAR WEB OF SPLIT FIBERS

Masahide Yazawa, Kunitachi; Kazuhiko Kurihara; Haruhisa Tani, both of Tokyo, and Masaki Matsumoto, Higashikurume, all of Japan, assignors to Polymer Processing Research Institute Ltd., Tokyo, Japan

Filed Aug. 23, 1974, Ser. No. 500,205

Claims priority, application Japan, Aug. 24, 1973, 48-94962

Int. Cl.² D04H 11/00

U.S. Cl. 19—161 R **4 Claims**

1. The method which comprises:

a. feeding a web of split fibers into an inlet roller device over an intervening space and through an outlet roller device,

b. supporting only the bottom of said web of split fibers during its movement between said inlet and outlet roller devices by disposing a plurality of narrow belts in supporting contact beneath said web of split fibers,

c. said plurality of narrow belts being arranged in a generally side-by-side relationship, but diverging away from each other in the direction in which the web is fed,

d. wetting the two outer narrow belts that are on the opposite sides of said plurality of narrow belts and temporarily adhering the lateral edges of said advancing web of split fibers to said two outer wetted narrow belts by virtue of the surface tension of the liquid on said two wetted belts, whereby as the web progresses from the inlet roller device to the outlet roller device it will be laterally spread to an extent corresponding to the diverging distance between said two outer wetted narrow belts, and the unwetted narrow belts that are intermediate said two outer wetted belts being arranged to slideably support the intermediate portion of the underside of said web so that the web is free to move laterally with respect to the surface of the unwetted intermediate belts, and

e. operating said outlet roller device at a withdrawal speed which is less than the feeding speed of said inlet roller device by an amount corresponding to the shrinkage of the web in a longitudinal direction that is caused by lateral spreading of said web.

3,953,910

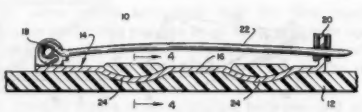
ANCHORING METHOD AND ARTICLE

Arthur Farb, P.O. Box 447, North Massapequa, N.Y. 11758

Filed Feb. 12, 1975, Ser. No. 549,138

Int. Cl.² A44C 3/00; A45F 5/02; B32B 31/00

U.S. Cl. 24—13 **11 Claims**



9. An article of ornamentation comprising a body and a finding, the finding including a sheetlike segment, means forming a pair of registered slits in an interior zone of the segment, the segment extending as a continuous loop between the slits, the loop extending beyond the plane of the segment and into the body, and the body being solidified and extending

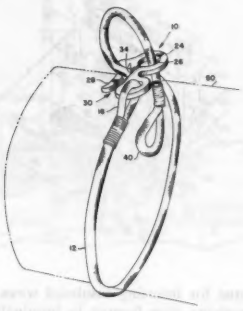
through the loop in interlocking engagement therewith, whereby the body is securely anchored to the finding and may be supported by fastening the finding to a supporting surface.

3,953,911

ADJUSTABLE TIE CORD ASSEMBLY

Walter W. Fishack, Dallas, Tex., assignor to Benson J. Harmon, Jr.; Gordon L. Wallace and Walter W. Fishack, all of Dallas, Tex.

Filed Mar. 25, 1974, Ser. No. 454,450
Int. Cl.² F16G *11/14*
U.S. Cl. 24—16 R **6 Claims**



1. An infinitely adjustable tie cord assembly comprising:
a stretch cord which decreases in cross sectional area when elongated by tension; and
a fastener connected at one end to one end of the stretch cord, the fastener comprising a body forming a passageway for receiving a human finger, the axis of the passageway being disposed generally normal to the axis of the stretch cord when the stretch cord is tensioned by pulling with a finger inserted in the passageway, said body further forming an open-ended slot having a progressively narrower width for receiving and gripping an intermediate portion of the stretch cord, the entirety of the slot for receiving the stretch cord being disposed to one side of the axis of the stretch cord when tensioned by a finger placed in the passageway and generally parallel to said tensioned stretch cord axis with the open end of the slot nearest the end of the body to which the stretch cord is attached,
whereby the stretch cord may be easily fastened around an object by placing a finger of one hand in the passageway, positioning the stretch cord around the object and gripping the other end of the stretch cord with the other hand to stretch the cord and around the object while placing an intermediate portion of the tensioned cord in the slot with a crossing motion of the hands.

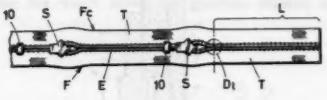
3,953,912

CONCEALED SLIDING CLASP FASTENER

Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed June 21, 1971, Ser. No. 155,046
Claims priority, application Japan, July 8, 1970, 45-59739
Int. Cl.² A44B *19/02, 19/36*
U.S. Cl. 24—205 R **1 Claim**

1. A concealed sliding clasp fastener chain comprising, in combination, a pair of continuous length stringer tapes each carrying a row of coupling elements, said coupling elements of one row interengaged with the coupling elements in the other row along length portions a plurality of separate sliders and a plurality of adjustable end stops separate from said sliders mounted at selected intervals on the rows of coupling elements for movement therealong independent of the movement of said sliders, said adjustable end stops being mounted over said coupling elements at said length portions thereof, each of said end stops having an inside surface forming a generally uniform channel, which surface extends transversely



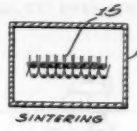
about and in close proximity to the outside surface defined by the interengaged coupling elements to accommodate such movement therealong so that said stops are substantially permanently mounted on said coupling elements and slidable therealong.

3,953,913

VELVET FABRIC

Perry H. Brown, Villa Park, Calif., and Maurice H. Tremblay, Cockesville, Md., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 418,116, Nov. 21, 1973, Pat. No. 3,838,983, which is a continuation of Ser. No. 212,468, Dec. 27, 1971, abandoned, which is a continuation of Ser. No. 861,024, Sept. 25, 1969, abandoned. This application June 26, 1974, Ser. No. 483,240
Int. Cl.² D06B *19/00*; D06C *7/00*; D03D *15/02, 27/00*
U.S. Cl. 28—76 P **1 Claim**



1. A method of making an antistatic velvet fabric, having textile metal pile filaments therein, by the steps of:
a. providing a base fabric;
b. interlacing a composite wire comprising metal filaments surrounded by a sacrificial matrix into said base fabric to form a metal wire pile-base fabric structure; and
c. removing the sacrificial matrix from the metal wire pile-base fabric structure forming a metal filament pile velvet fabric.

3,953,914

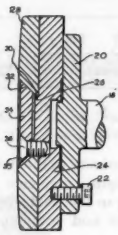
MOUNTING ARRANGEMENT

Joseph B. Huber, Acme, and Thomas A. Brown, Greensburg, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Aug. 2, 1974, Ser. No. 494,082
Int. Cl.² B21C *37/30*; B21B *31/08*
U.S. Cl. 29—90 B **7 Claims**

1. A support device for a burnishing roll comprising a ring-like member of cemented hard metal carbide, said member having an abutment region on one side and having a central conical recess in the other side, said abutment region adapted for abutting a steel support, a conical clamp element in said recess, and bolts extending through said clamp element and threadedly engaging said steel support, said other side of said ring-like member having a central region which is perpendicular to the central axis of the ring-like member and an outer region which inclines rearwardly from the periphery of said

central region, said outer region having a radially inner portion which inclines at a smaller included angle to the plane of



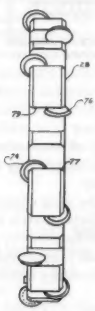
said central region and a radially outer portion which inclines at a larger included angle to the plane of said central region.

3,953,915

METHOD AND APPARATUS FOR REMOVING TREAD MATERIAL FROM RADIAL BELTED TIRES

William E. Fawcett, Latrobe, and Robert S. Gulibon, Mount Pleasant, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Feb. 4, 1975, Ser. No. 546,989
Int. Cl.² B26D 1/12
U.S. Cl. 29—105 R 7 Claims



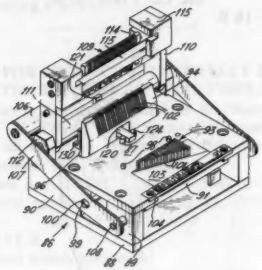
1. A tool for cutting tread material from a pneumatic tire preparatory to retreading of the tire, said tool comprising; a disc-like body, reversibly rotatable about its central axis and having a plurality of slots extending inwardly from the periphery thereof and uniformly distributed circumferentially about said body, alternate ones of said slots forming a first and a second set of slots, the slots of said sets being inclined in respectively opposite directions relative to a radius of said body passing therethrough, each slot adapted for receiving a hardened insert therein, hardened inserts disposed in said slots, means for aligning the inserts in said first set of slots in a first plane perpendicular to the axis of said body and the inserts in said second set of slots in a second plane parallel to and axially spaced from said first plane, and clamping means for fixedly securing the inserts in said slots.

3,953,916

WIRE INSERTING AND TRIMMING APPARATUS

Claude Rolland, Argenteuil, and Jacques Delalle, Verneuil sur Seine, both of France, assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 19, 1975, Ser. No. 578,855
Claims priority, application France, May 22, 1974, 74.17985
Int. Cl.² H01R 43/04
U.S. Cl. 29—203 MW 12 Claims



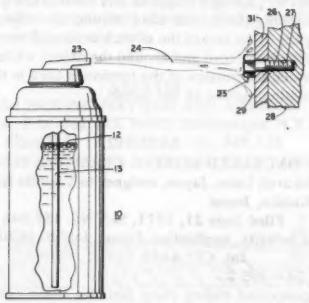
1. Apparatus for inserting insulated wires simultaneously into wire receiving slots formed in terminals mounted in a connector housing to electrically connect the wires to the terminals and for trimming the wire ends, comprising first and second wire-receiving combs upstanding from opposite sides of a horizontal connector bed with their teeth in alignment, a wire insertion and trimming ram reciprocable relative to the bed and along a path extending between the combs, a third wire-receiving comb mounted for movement from a position remote from the bed to permit loading of the connector onto the bed to a position adjacent the bed overlying the connector when so loaded and in which the teeth are aligned with the teeth in the first and second combs and the terminal slots.

3,953,917

METHOD FOR FREEING A FASTENER

David T. Stebbins, 4055 Executive Park Drive, Cincinnati, Ohio 45241

Filed Aug. 27, 1973, Ser. No. 391,782
Int. Cl.² B23P 19/02
U.S. Cl. 29—427 8 Claims

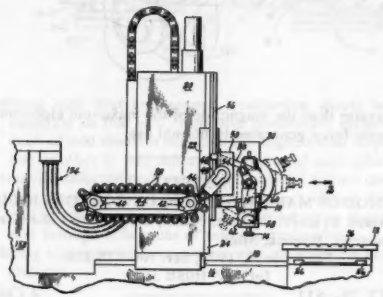


1. A method of freeing a threaded metal fastener from a threaded socket which comprises directing a stream of a pressurized liquid which is a gas at ambient temperature against a head of the fastener to chill the fastener, and turning the fastener while chilled to free the fastener.

3,953,918
MACHINE TOOL WITH AUTOMATIC TOOL CHANGER

Kendall Frederick Bone, and Oskar Reinhold Johansson, both of Cincinnati, Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed June 25, 1975, Ser. No. 590,027
Int. Cl.² B23Q 3/157
U.S. Cl. 29—568 19 Claims



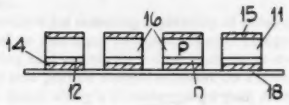
1. A tool changing machine comprising in combination:
a. a saddle member;
b. a tool carrier supported by the saddle for angular motion around an axis extending transversely through the saddle member;
c. an operating station in the tool carrier and having an axis of orientation, transverse to the axis of angular motion of said carrier, the operating station adapted for receipt and retention of a tool aligned on the axis of orientation;
d. a pick-up station on the saddle member adapted to receive and hold a tool in alignment with the axis of angular motion;
e. a transport mechanism supported on the tool carrier for rotation about an axis angularly positioned between said axes of operating station orientation and tool carrier angular motion;
f. a means for swinging the tool carrier and transport mechanism in angular motion while maintaining the axis of rotation of the transport mechanism in a single plane with the axes of operating station orientation and tool carrier angular motion;
g. an attachment mechanism on the transport mechanism operable to grip and release tools at the operating and pick-up stations when moved into alignment therewith; and
h. a means for moving the transport mechanism to positions of alignment wherein said attachment mechanism engages tools in the operating and pick-up stations and for coordinating movement of the transport mechanism with operation of said attachment mechanism whereby tools are changed between the pick-up and operating stations.

3,953,919
METHOD OF MANUFACTURING SEMI-CONDUCTOR DEVICES

Alan Raymond Moore, Aldridge, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Dec. 30, 1974, Ser. No. 537,339
Claims priority, application United Kingdom, Jan. 18, 1974, 2541/74
Int. Cl.² B01J 17/00; H01L 7/66
U.S. Cl. 29—583 4 Claims

1. A method of manufacturing semi-conductor devices comprising the steps of:
a starting with a semi-conductor wafer having at least one n-type zone and at least one p-zone,
b applying an etchant resistant material to the major surfaces of the wafer,
c dividing the wafer into individual devices by sawing or scribing part of the way through the wafer and then cracking the wafer along the grooves defined by the

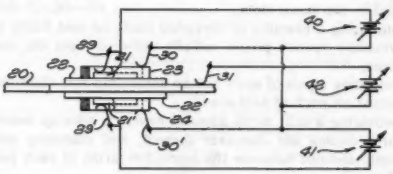


sawing or scribing operation,p-n junctions being exposed at the divided edges of the devices,
d after step (c), mounting the individual devices on an etchant resistant, adhesive tape with one major surface of each device being presented to the tape, and then
immersing the tape, with the devices carried thereby, in an etchant so that the divided edges of the devices are etched.

3,953,920
METHOD OF MAKING A TRANSDUCER

Teruyuki Endo, Alhambra, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed May 14, 1975, Ser. No. 577,412
Int. Cl.² H01S 4/00
U.S. Cl. 29—592 7 Claims



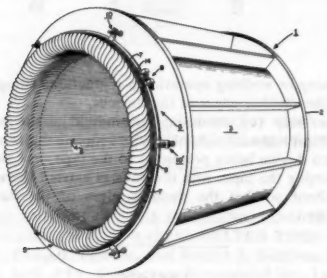
1. The method of making a transducer, said method comprising the steps of: holding a layer of glass against a metal beam with a piece of auxiliary glass; holding a strain gauge against said layer; connecting the auxiliary glass to a first negative terminal of a first D.C. source of potential; connecting said strain gauge to the positive terminal on said first source; connecting one end of a loose first lead to said auxiliary glass; connecting one end of another loose second lead to said beam; heating an assembly including said layer of glass, said auxiliary glass, said strain gauge and said beam while the voltage of said first source is applied to the structures connected thereto until a bond is achieved between said strain gauge and said glass layer; disconnecting at least one of said first and second terminals; connecting said first and second leads to the third negative and fourth positive terminals of a second D.C. source of potential; and heating said assembly while said second source is connected as aforesaid until a bond is achieved between said layer and said beam, said assembly being kept in the self-same oven from the time said first heating step is performed until said layer is bonded to said beam.

3,953,921

TIELESS METHOD FOR SUPPORTING END TURNS OF A DYNAMOELECTRIC MACHINE

Luis Alberto Estrada, and Warren Pierce Wielt, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 493,687, Aug. 1, 1974, Pat. No. 3,924,149.
This application Mar. 18, 1975, Ser. No. 559,453
Int. Cl.² H02K 15/06
U.S. Cl. 29—596 3 Claims



1. A tieless method of bracing the winding end turns of a dynamoelectric machine comprising the steps:

1. providing a dynamoelectric machine having a frame with a stator mounted therein, said stator being provided with slots adapted to receive an insulated winding therein, said insulated winding having end turns that extend beyond opposite ends of said stator when the winding is assembled in the stator slots,
2. mounting a plurality of threaded studs on said frame at arcuately spaced points radially outward from the end turns,
3. mounting a pair of arms and an associated arm clamping means on each of said studs,
4. providing a split metal annulus having a take-up means for reducing the diameter thereof, and clamping said metal annulus between the respective arms of each pair of arms,
5. positioning an absorbent, compressible felt ring between the annulus and the stator winding end turns,
6. adjusting the arm clamping means to move the annulus to a desired position relative to said end turns,
7. operating said take-up means to compress the felt ring against said end turns,
8. impregnating the winding and said felt ring with insulating resin, and
9. curing said resin.

3,953,922

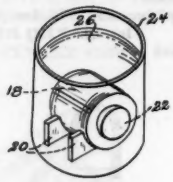
METHOD OF ELIMINATING THE TRAINING EFFECT IN SUPERCONDUCTING COILS BY POST-WIND PRELOAD

Joseph R. Heim, Aurora, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 24, 1975, Ser. No. 552,525
Int. Cl.² H01F 7/06
U.S. Cl. 29—602 R 6 Claims

1. A method of conditioning a wound superconducting coil formed of a plurality of filaments of superconducting material in a matrix of normal conducting material comprising the step of:

stressing the coil in the directions of the electromagnetic forces generated in normal use and in a magnitude



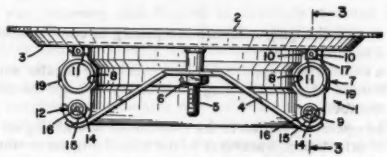
greater than the magnitude of the maximum electromagnetic force generated in normal use.

3,953,923

METHOD OF MAKING HEATING DEVICE FOR LIQUIDS

H. Eugene Rygmyr, Winona, Minn., assignor to Lake Center Industries, Winona, Minn.

Filed Dec. 9, 1974, Ser. No. 528,226
Int. Cl.² H05B 3/00
U.S. Cl. 29—611 4 Claims



1. The method of producing a heater for liquid comprising:

a. extruding a length of heat conductive material to provide a generally straight elongated body having a pair of laterally spaced parallel holes extending longitudinally therethrough;
b. inserting an elongated heating element longitudinally through one of said holes in snug fitting engagement with said body;
c. and thereafter bending at least a portion of said body and heating element between the ends thereof about an axis extending transversely with respect to said body into an arcuate curve, whereby to reduce the transverse dimension of said one of the holes in at least one direction, so that said heating element is tightly gripped by said body within said one of the holes.

3,953,924

PROCESS FOR MAKING A MULTILAYER INTERCONNECT SYSTEM

Clyde L. Zachry, La Habra, and Andrew J. Niedzwiecke, Perris, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

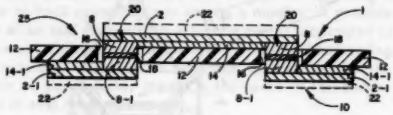
Filed June 30, 1975, Ser. No. 591,591
Int. Cl.² B41M 3/08
U.S. Cl. 29—625 7 Claims

1. A process for making an interconnect system for a multilayer circuit, which comprises:

applying a masking material in a prescribed pattern selectively including masked and unmasked areas to first and second electrically conductive sheets;
filling said selectively unmasked areas with an electrically conductive material;
removing the masking material from each of said first and second sheets, thereby leaving said prescribed pattern of conductive material on each of said respective sheets;

removing through-hole areas from an electrically insulating substrate, said areas substantially corresponding in configuration to that of said prescribed pattern of conductive material;

coating at least some of said first and second conductive sheets and said insulating substrate with a laminating material;



affixing said first and second conductive sheets to said substrate so that said respective conductive material on each of said sheets is substantially aligned with respect to one another in said throughhole areas of said substrate;

removing selected portions of said first and second conductive sheets to accordingly interconnect circuit lines of said multilayer circuit through said conductive material in said through-hole areas of said substrate; and

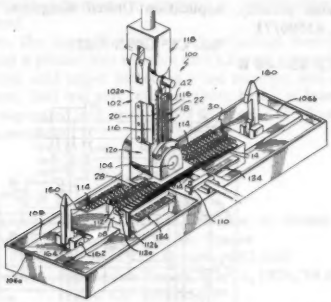
plating said interconnect system with a protective layer of material.

3,953,925

INSTALLATION TOOL AND METHOD FOR INSTALLING A PLURALITY OF WIRES ON AN ELECTRICAL CONNECTOR FRAME

Robert Everett Wilson, Agoura, Calif., assignor to Viking Industries, Inc., Chatsworth, Calif.

Filed Dec. 12, 1974, Ser. No. 531,928
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **9 Claims**



1. Wire installation apparatus for installing a set of wires on a rearward portion of an electrical connector frame comprising:

a base;

a frame-holding device mounted on said base for holding a connector frame;

a wire-holding device mounted on said base, including a pair of spaced jig means for holding a plurality of wires in extension therebetween;

one of said devices being movably mounted on said base to move in a predetermined path towards the other device to enable said wires held by said wire-holding device to press against a connector frame held by said frame-holding device, and said frameholding device having a leading portion which is closest to said wire-holding device as said devices approach one another;

first and second cutting blade means, each fixed with respect to a different one of said devices to pass closely across the other cutting blade means and sever wires extending between said pair of jig means prior to the severed wires pressing against a connector frame on said frame-holding device;

said pair of jig means being spaced apart, in a predetermined lateral direction perpendicular to the direction of movement of said movable device, by a distance greater than the depth along said predetermined direction of said leading portion of said frame-holding device, to allow said frame-holding device to move relative to said jigs far enough past the cutting blade means on the wireholding device to fully install the cut wire ends on the connector frame.

7. A method for installing a plurality of wires on a rearward portion of an electrical connector frame, comprising:

mounting said connector frame, with the rearward connector frame portion thereof exposed, on a movable arm that cam move along a predetermined path from a predetermined neutral position to a second position;

mounting first and second locations along each wire at positions on either side of the path of said rearward connector frame portion when said arm moves along said path while leaving the region inbetween said positions unobstructed to arm movement;

moving said arm along said predetermined path from said neutral position toward said second position, severing said wires between said first and second locations thereof, and pressing the severed end portions of said wires which extend to said first locations thereof into said rearward frame portion;

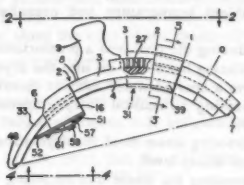
said second locations on said wires being mounted at positions further from said neutral arm position, as measured along said arm path, than said first locations on said wires, whereby to prevent obstruction of arm movement.

3,953,926

HAIR CUTTING AND TRIMMING DEVICE

James D. Kallikounis, 28024 Santona Drive, Palos Verdes Peninsula, Calif. 90274

Filed Feb. 11, 1975, Ser. No. 548,981
Int. Cl.² B26B *21/12*
U.S. Cl. 30—31 **13 Claims**



1. A hair cutting and trimming device, comprising:

a. a body portion having a concave surface defining one side thereof;

b. a comb structure mounted on said body portion for selective movement relative thereto and including a base section and a multiplicity of arcuate tines projecting cantilever fashion from said base section, the curvature of said arcuate tines complementing the curvature of said concave surface of said body portion;

c. a hair cutting blade mounted on said body portion and disposed on the side of said times remote from said body portion; and

d. means for locking said comb structure to said body portion to adjust the position of said hair cutting blade in relation to said tines to control the height to which the hair is cut when said blade is moved in relation to the hair.

11. A hair cutting and trimming device, comprising:

a. a body portion having a concave surface defining one side thereof;

b. a comb structure mounted on said body portion for selective movement relative thereto and including a base section and a multiplicity of arcuate tines projecting cantilever fashion from said base section, each tine having a plurality of transverse notches for retaining and elevating hair strands;

c. a hair cutting blade mounted on said body portion and disposed on the side of said tines remote from said body portion; and

d. means for locking said comb structure to said body portion to adjust the position of said hair cutting blade in relation to said tines to control the height to which the hair is cut when said blade is moved in relation to the hair.

3,953,927

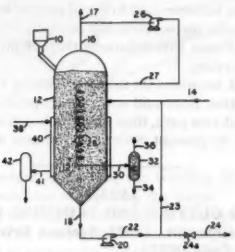
DRYING COAL IN HOT OIL SLURRY USING RECYCLED STEAM

Franklin D. Hoffert, Mountainside, N.J., assignor to Hydrocarbon Research, Inc., Morristown, N.J.

Filed Mar. 24, 1975, Ser. No. 561,544

Int. Cl.² F26B *3/00*

U.S. Cl. 34—9 **9 Claims**



1. A process for drying moisture-containing coal having at least about 4 weight percent moisture in a coal-oil slurry at above ambient temperature and pressure, comprising the steps of:

a. introducing the coal into a pressurized drying zone;

b. introducing hot slurry oil into the drying zone sufficient to form a coal-oil slurry mixture therein;

c. maintaining the coal-oil slurry temperature at least about 250°F;

d. withdrawing steam from the drying zone from above the coal-oil slurry level;

e. compressing the steam and recycling it in indirect heat exchange relationship with the coal-oil slurry so as to heat the slurry while condensing the steam, and

f. withdrawing the dried coal slurry from the bottom of the drying zone.

3,953,928

COOLING OF HOT PARTICULATE MATERIAL PARTICULARLY CALCINED PETROLEUM COKE

Anton R. Novy, Johnson City, Tenn., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,850

Int. Cl.² F26B *7/00*

U.S. Cl. 34—13 **11 Claims**

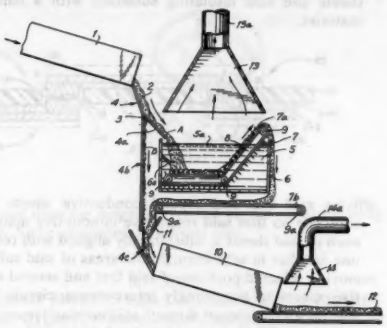
1. A method of cooling a calcined particulate material from its approximate temperature of calcination to a lower temperature at which it can be shipped or stored which comprises:

a. dividing the particulate material into separate major and minor portions;

b. immersing the major portion in a quenching tank of water to cool it;

c. separating the cooled particulate material from the water; and

d. merging the cooled major portion of quenched particulate material with the minor portion of substantially hotter non-quenched material in suitable proportions and for



sufficient length of time that substantially all of the remaining moisture in the quenched material is caused to be vaporized by the heat received from the non-quenched material and the temperature of the non-quenched material is substantially lowered so that the average temperature of the merged materials is reduced.

3,953,929

TEACHING MACHINES

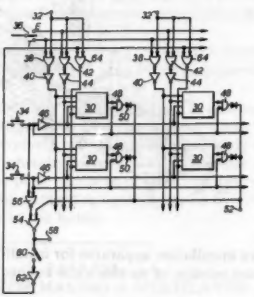
Charles Edward Mark Hansel, 44 Eaton Crescent, Swansea, Glamorgan SA1 4QL, Wales

Continuation of Ser. No. 289,932, Sept. 18, 1972, abandoned. This application Mar. 27, 1975, Ser. No. 562,549

Claims priority, application United Kingdom, Sept. 17, 1971, 43506/71

Int. Cl.² G09B *7/02*

U.S. Cl. 35—48 R **10 Claims**



1. A single-station question and answer teaching machine having teaching and examining modes of operation comprising: means for alternatively selecting teaching and examining operating modes; a plurality of settable memory means; a plurality of terminal means, each of said terminal means being connected to a different group of said plurality of memory means for setting in a different question identifier for each question to be answered; a plurality of selector means for selectively providing a correct answer and a response to a plurality of possible answers at said single station, each of said plurality of selector means being connected in common to a corresponding memory means, the corresponding memory means in each of said groups being set in response to the activation of an appropriate one of said selector means and

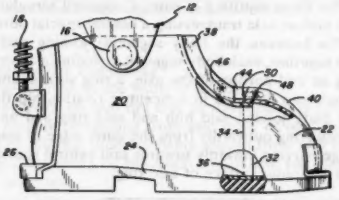
said terminal means corresponding to said group for storing a correct answer and question identifier to a question when said alternatively selective means is operated to select the teaching operating mode and for retaining the correct answer for use during a subsequent examining mode; and comparing means connected to said corresponding memory means having the correct answer and to said selector means for selecting a response to each question from among a number of possible answers when said alternatively selecting means is operated to select the examining operating mode, whereby said comparing means indicates whether the response represented by the operation of said selector means is the same as the answer retained in said memory means.

3,953,930

SKI BOOT WITH FLEXIBLE TOE

Paul C. Ramer, Denver, Colo., assignor to Alpine Research, Inc., Golden, Colo.

Filed Mar. 19, 1975, Ser. No. 559,783
Int. Cl.² A43B *00/00*
U.S. Cl. 36—94 **9 Claims**



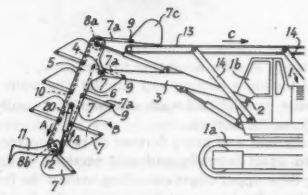
1. An article of footwear comprising in combination:
a sole, and
an upper, the upper having the sole attached thereto and defining a pocket into which a user's foot is adapted to be received, said upper including a toe member and a rear member, said toe and rear members being at least partially separated and operatively telescopic to allow relative movement.

3,953,931

EXCAVATOR

Pierre J. Leyrat, Trilport, France, assignor to Societe Anonyme: Poclain, Le-Plessis-Belleville, France

Filed Feb. 24, 1975, Ser. No. 552,210
Claims priority, application France, Mar. 1, 1974, 74.07104
Int. Cl.² E02F *5/06*
U.S. Cl. 37—87 **5 Claims**



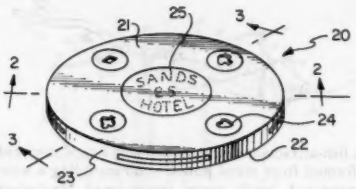
1. A public works machine comprising, a main frame, a jib hinged at one end to the main frame, a balance beam hinged at one end to the jib; an endless bucket chain conveyor movably mounted on said balance beam for movement in translation along said balance beam and including a plurality of buckets thereon, and a bottomless scoop mounted on the free end of the balance beam and including a transverse blade and two lateral arms hinged on the balance beam, said scoop having an opening therein located to permit buckets carried by said chain conveyor to pass one after the other through the scoop, and cooperating means on said scoop and said bucket for preventing rearward movement of the bucket with respect to the scoop as it passes between the lateral arms of the scoop through said opening, thereby to create temporarily a complete bucket.

3,953,932

CASINO CHIP AND METHOD OF MAKING

John W. Graves, 6838 E. Coronado Road, Scottsdale, Ariz. 85257

Filed Feb. 18, 1975, Ser. No. 550,674
Int. Cl.² G09F *3/02*
U.S. Cl. 40—27.5 **3 Claims**



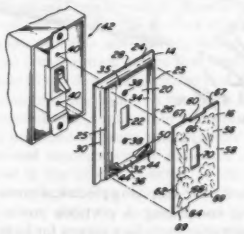
1. A casino chip comprising an intermediate portion having a peripheral wall and a central opening, a plurality of spaced notches disposed along said peripheral wall, said intermediate portion having at least one projection extending outwardly from each side, each of said projections having an outer face, an outer portion fused to opposite sides of said intermediate portion and extending through the central opening thereof and each of said notches, said outer portion having a peripheral wall through which the peripheral wall of said intermediate portion is visible, said outer portion being substantially flush with the outer faces of said projections so that said outer faces are visible, said outer portion having opposed recesses, an indicia carrying disk fixed within each of said recesses, and said intermediate portion and said outer portion being of different colors, whereby a plurality of colors are visible on opposite sides and along the edge of the casino chip.

3,953,933

COVER PLATE ASSEMBLY

Edwin Goldstein, Berkeley Heights, N.J., assignor to Dilly Mfg. Co., Inc., South Plainfield, N.J.

Filed Jan. 9, 1974, Ser. No. 432,105
Int. Cl.² G09F *1/12*
U.S. Cl. 40—152 **18 Claims**



1. A cover plate assembly comprising first and second members, each of said members having an aperture through which an element can extend, said first member including wall portions having facing surfaces thereon, said aperture being disposed between said facing surfaces, said second member

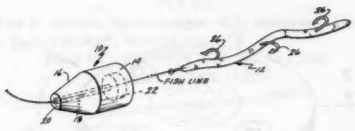
having at least two opposite edges and being supported on said first member with a portion of each of said opposite edges adjacent each of said facing surfaces, and resilient means disposed between said first and second members for resiliently and releasably urging said second member against one of said facing surfaces so that said second member is releasably retained on said first member with said apertures being aligned.

3,953,934

ODORIFEROUS FISHING DEVICE

Melvin J. Visser, 6212 Hampton, Portage, Mich. 49081

Filed Apr. 2, 1975, Ser. No. 564,279
Int. Cl.[2] A01K 85/00
U.S. Cl. 43—42.06 25 Claims



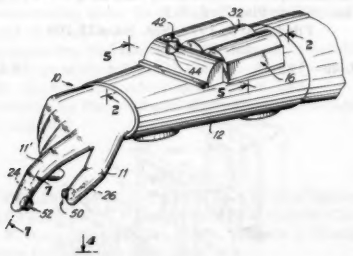
1. A fish-attractant device comprising a rigid, sintered metal body formed from metal powder and including a network of interconnected, small pores interspersed throughout said body, at least a portion of said pores extending into communication with the exterior surface of said body; said pores containing a fish attractant such that said body is impregnated with said attractant, said attractant being exposed to the exterior surface of said body in said portion of said pores for contact with the water in which said device is immersed, said attractant being delivered and exposed at said exterior surface of said body at a generally constant, uniform, slow rate during use to provide a fish-attracting odor facilitating the catching of fish.

3,953,935

POWER SUPPLY TOY

Lawrence L. Reiner, Woodbury, N.Y., and John P. McNett, Short Hills, N.J., assignors to Lawrence L. Reiner, Woodbury, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,086
Int. Cl.[2] A63H 33/26
U.S. Cl. 46—45 21 Claims



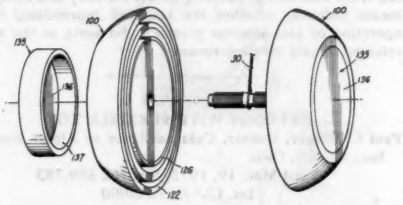
1. A toy device for supplying electrical power to electrically actuated toys, comprising: a portable power pack having a plurality of batteries including means for being supported on some part of the body of the user, a pair of output contact elements, the spacing of which may be adjustable; and means forming conductive paths extending between said power pack and said contact elements; and said path forming an open electrical circuit condition adapted to be closed upon electrical contact with a pair of mutually co-operatively associated contact elements on a toy device to be electrically operated.

3,953,936

YO-YO

Thomas H. Ennis, 4306 N. Shallowford Road, Chamblee, Ga. 30341

Filed Nov. 13, 1974, Ser. No. 523,450
Int. Cl.[2] A63H 1/30
U.S. Cl. 46—61 15 Claims



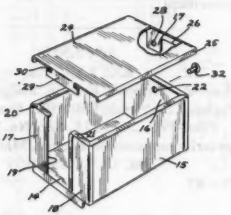
1. A Yo-Yo comprising a pair of opposed circular body segments and an axle transversing a central spacial portion of the Yo-Yo between the body segments joining said body segments together, each body segment including a central hub receiving an end portion of the axle, a ring surrounding said central hub and disposed in concentric relationship thereto, an inner plate joining said hub and said ring and an outer flange projecting outwardly from the outer edge of said ring, said flange curving inwardly towards said central spacial portion over the outer surface of said ring.

3,953,937

PART ASSEMBLY FOR TOY VEHICLES

Lee J. Pfeilsticker, Long Lake, Minn., assignor to Tonka Corporation, Hopkins, Minn.

Filed Dec. 9, 1974, Ser. No. 530,941
Int. Cl.[2] A63H 17/26
U.S. Cl. 46—221 1 Claim



1. In a truck box for miniature toy vehicles,

a. a box having a bottom and parallel side walls and front and rear parallel end walls extending upwardly equidistant from the bottom,

b. the rear end wall being formed of two coplanar sections spaced apart laterally and said sections having flanges along their upper edges extending toward the front wall,

c. a rectangular top panel for covering the box having depending flanges along its side edges for engaging against said side walls and a tab extending downwardly from the front edge thereof to engage against the front end wall of the box,

d. a hook flange depending from the central portion of the rear edge of the panel with the end portions thereof extending laterally in spaced relation to the panel under the flanges on said sections to lock the rear edge of the panel to the box,

e. the said tab and front end wall of the box having aligned apertures, and

f. a rivet extending through said apertures to lock the front edge of the panel to the box.

3,953,938

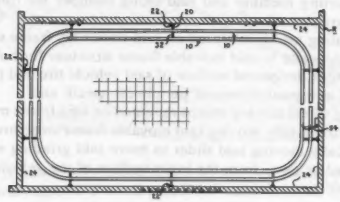
MEANS FOR SUPPORTING A TOY CRAFT

Jerry W. Kilgore, 5600 E. 3rd Ave., Gary, Ind. 46403

Filed Jan. 24, 1975, Ser. No. 543,808

Int. Cl.² A63H *19/24*

U.S. Cl. 46—260 **8 Claims**



1. A toy device comprising:

a rail supported on the walls of a room,

a drive device on said rail free to travel on said rail;

a bar member extending from said drive device, the distal end of said bar member being spaced from said rail;

a magnet provided on the distal end of said bar member;

a toy craft; and

a magnet attracting member on said toy craft, said craft being held to said magnet at said magnet attracting member solely by the magnetic pull of said magnet.

3,953,939

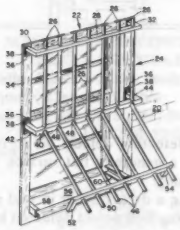
MOVABLE GRILL GUARD

Charles Klein, Sierra Madre 110, Mexico City, Mexico

Filed Feb. 26, 1974, Ser. No. 445,947

Int. Cl.² E06B *3/68*

U.S. Cl. 49—56 **8 Claims**



1. Means for securing an opening in a building against entry without preventing an exit therefrom, said securing means comprises;

grill means extending substantially vertical over said opening;

means for attaching said grill means to said building, said attaching means allowing pivotal movement of the lowermost portion of said grill means about said attaching means;

structure means for holding the lowermost portion of said grill means over said opening by preventing said pivotal movement, and

quick release locking means hand operable only inside said building and offset at least a predetermined distance from said opening to prevent operation from outside said building, said quick release locking means securing said structure means into position, upon release of said quick release locking means from inside said building, said structure means will allow said pivotal movement of said lowermost portion of said grill means to allow exit from said building through said opening.

3,953,940

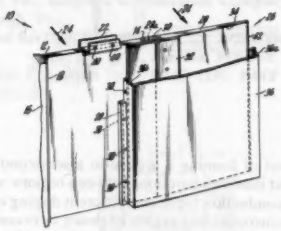
COUNTERFORCE ASSEMBLY FOR DOORS

Joseph Zaslow, 2607 Ave. X, Brooklyn, N.Y. 11235

Filed Oct. 17, 1974, Ser. No. 515,495

Int. Cl.² E06B *11/04*

U.S. Cl. 49—135 **13 Claims**

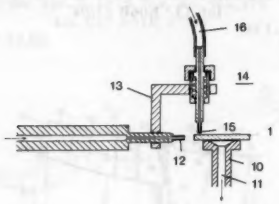


1. A counterforce assembly for doors exposed to high pressure differentials on the two sides thereof which result in large forces acting on one side of the door tending to maintain the same closed against a door jamb, the assembly comprising a planar counterforce panel mounted for movement and exposed to substantially the same high pressure differentials to which the door is exposed to result in corresponding large forces acting on one side of said panel; coupling means connected to the door and to said panel for applying the large forces acting on said panel to the door and counteracting the large forces acting on the door so that movement of said panel when coupled to the door counteracts the large forces acting on the door and facilitates opening of the door irrespective of the magnitudes of the pressure differentials to which the door and said panel are exposed; a substantially closed pressure shield having at least one opening, said panel being mounted for substantially transverse movements within said pressure shield to define together with said pressure shield a substantially closed compartment in all positions of said panel, said one side of said panel being exposed through said at least one opening to the exterior of said compartment and to the high pressure side to which said one side of the door is exposed, the other surface of said panel facing the interior of said compartment providing a low pressure side; venting means for venting the interior of said compartment to the low pressure side to which the other side of the door is exposed so that the pressure differential is maintained the same on the door and on said panel in all positions of said panel within said pressure shield; seal means being provided between said pressure shield and said panel to prevent equalization of pressures on the two sides of said panel in the closed position of the door; said coupling means moving said panel and the door together between a first position when the door is closed and a second position when said panel is within said pressure shield and the door is opened an initial degree corresponding to the movement of said panel, said second position of the door breaking the pressure seal at the door to reduce the pressure differential across the door to a negligible quantity, said coupling means permit the door to be opened an additional degree without corresponding movement of said panel, the door being moved said additional degree without assistance of said panel.

3,953,941
METHOD AND APPARATUS FOR MAKING A GROOVE IN A SEMI-CONDUCTOR ELEMENT

Otto Kuhn, Lupfig, and Samuel Schweitzer, Birr, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 11, 1974, Ser. No. 514,251
Claims priority, application Switzerland, Oct. 11, 1973, 14509/73
Int. Cl.² B24C 1/04, 3/22
U.S. Cl. 51—15 R **6 Claims**



1. A method of forming a groove in a semiconductor element having at least two junctions between regions of alternating opposite conduction types and different doping concentrations, the seminconducting region enclosed between the junctions exhibiting a higher resistivity than either of the neighboring regions, the element having tapers in its lateral surface in the form of a groove symmetrically disposed between neighboring junctions where they come to the surface, the method comprising the steps of:

directing an abrasive blast from a sandblast nozzle at the semiconductor element's surface to produce said groove;

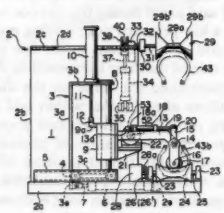
sensing the position of said nozzle relative to a single surface of said element which is parallel to said junctions of said element; and

automatically guiding said nozzle, in response to said sensing, parallel to the semiconductor junctions while a relative motion between the semiconductor element and the sandblast nozzle is produced.

3,953,942
APPARATUS FOR GRINDING INNER SURFACE OF A VEHICLE TIRE

Seiichiro Nisimura, Shakujii, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Feb. 6, 1975, Ser. No. 547,878
Claims priority, application Japan, Feb. 15, 1974, 49-18772
Int. Cl.² B24B 5/50
U.S. Cl. 51—33 W **16 Claims**



1. An apparatus for grinding the inner surface of a vehicle tire to remove rubberized material together with a mold releasing agent comprising:

frame means including a stationary frame structure and a movable frame structure horizontally movably mounted on said stationary frame structure, said movable frame structure having at least a substantially vertically upstanding guide member and a slider slidably coupled with said upstanding guide member;

a supporting member fixedly mounted on the forward surface of said slider;

a swing member pivotally mounted on the forward end portion of said supporting member;

a grinding wheel rotatably mounted on the lower end portion of said swing member;

swinging means mounted on said supporting member for swinging said swing member about its own axis;

grinding wheel rotating means mounted on said slider, said supporting member and said swing member for rotating said grinder wheel;

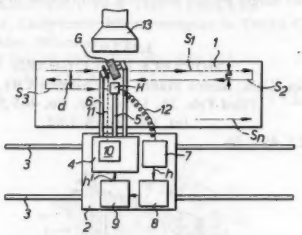
tire rotating means mounted on said stationary frame structure opposite to said movable frame structure for holding the outer peripheral surface of said vehicle tire and rotating it at a predetermined peripheral speed; and

grinding wheel moving means mounted on said frame means for horizontally moving said movable frame structure and vertically moving said slider to move said grinding wheel toward or away from the inner surface of the vehicle tire on said tire rotating means.

3,953,943
APPARATUS FOR AUTOMATICALLY DETECTING AND ELIMINATING FLAWS ON SLABS OR BILLETS

Elichi Nakaoka, Kyoto, Japan, assignor to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Feb. 27, 1975, Ser. No. 553,639
Int. Cl.² B24B 49/00
U.S. Cl. 51—34 E **4 Claims**



1. Apparatus for detecting defects on an object such as a slab or billet having a generally flat surface and eliminating said defects, comprising:

means for detecting a defect on or in said surface;

means for eliminating said defect detected by said detecting means;

a carriage reciprocable alongside said object, said detecting means and said eliminating means being mounted on said carriage in a predetermined positional relation relative to each other;

first moving means for moving said carriage relative to said object so that said detecting means scans said surface, with said eliminating means following said detecting means a predetermined distance behind along the scanning locus of said detecting means;

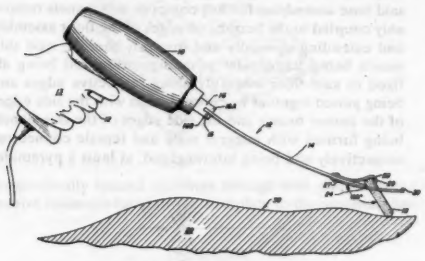
second moving means for moving said detecting means and said eliminating means relative to said carriage and across said object transversely of the direction of reciprocation of said carriage; and

control means operable in response to said detecting means to operate said eliminating means to eliminate said defect previously detected by said detecting means.

3,953,944
TOOL HOLDER CONSTRUCTION

Edwin R. Olson, 425 Bluebonnet Lane, Hoffman Estates, Ill. 60172

Filed Aug. 12, 1974, Ser. No. 496,543
Int. Cl.² B24B 23/04
U.S. Cl. 51—170 TL 12 Claims



1. A tool holder construction to support a work piece eroding tool against a work piece for reciprocation by a power source, said tool holder construction comprising:

an elongated flexible wand means having one end secured to such power source for reciprocation along the longitudinal axis of said wand means,

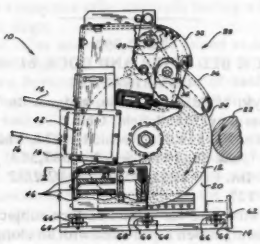
tool support means at the other end of said wand means and having an aperture to receive said tool,

said aperture being larger than the cross section of said tool along said axis whereby engagement of a free end of said tool with a work piece causes said tool to rotate into engagement with longitudinally spaced edges of said wand means which define said aperture, the angular disposition of said tool relative to said wand means tool support means being dependent upon the size of said aperture and resulting rotation of said tool relative to said longitudinally spaced edged, said tool support means being in such spaced relation with said wand means one end that the angular disposition of a tool disposed therein may be readily altered by flexing said wand means so as to rotate a new tool surface into engagement with said work piece.

3,953,945
GRINDING MACHINE WITH ENERGY ABSORBING BREAKAGE GUARD

Richard A. Dahlin, Holden, Mass., assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed June 27, 1975, Ser. No. 590,956
Int. Cl.² B24B 55/04
U.S. Cl. 51—269 10 Claims

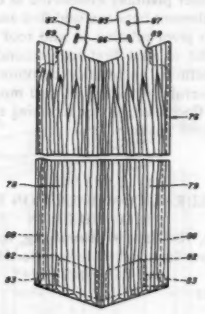


1. A grinding machine comprising a base, a rotatable grinding wheel connected with said base and having a generally circular peripheral surface which engages a workpiece during a grinding operation, means for rotating said grinding wheel at a relatively high speed relative to said base during a grinding operation, and energy absorbing means disposed adjacent to said grinding wheel for absorbing energy released in the event of breaking of said grinding wheel into a plurality of fragments during a grinding operation, said energy absorbing means including a body of material, cutter means for cutting away a portion of said body of material, and actuator means for effecting relative movement between said body of material and said cutter means under the influence of forces applied to said actuator means by fragments of said grinding wheel to effect a cutting away of a portion of the body of material and an absorbing of energy.

3,953,946
METAL SHAKE OR SHINGLE PANEL AND ACCESSORIES

Robert M. Peters, and Kenneth E. Nowicki, both of Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 517,101, Oct. 23, 1974. This application Apr. 23, 1975, Ser. No. 570,648
Int. Cl.² E04B 7/00; E04D 1/30; B44F 7/00
U.S. Cl. 52—57 9 Claims



1. a ridge cap for disposal on the peak of a roof covered with shakes or shingles, the ridge cap having a main wall formed to provide a surface that simulates the appearance of wooden shingles or shakes, the main wall comprising two sections angularly disposed with respect to each other to form a crest adjacent the center of the ridge cap, with each section having a forwardly facing, integral, front wall dependent therefrom at a substantially right angle thereto, and simulating the cut edge of a wooden shake, with each front wall having a return bend portion extending beneath the section, and an integral side wall dependent from the opposed sides of the main wall and located at a substantially right angle to the plane of each section, and extending from the front wall to the rear of the ridge cap, said side walls decreasing in height from the front walls to the rear of the ridge cap, a return bend portion folded over each of the sections at the rear thereof, and a raised portion provided in the crest of the ridge cap at the rear thereof to provide a water dam.

3,953,947
FOLDABLE BUILDING MODULE

John H. Hendrich, 5 W. 10th St., Erie, Pa. 16501

Division of Ser. No. 332,677, Feb. 15, 1973, Pat. No. 3,863,419, which is a continuation-in-part of Ser. No. 178,942, Sept. 9, 1971, abandoned. This application Mar. 14, 1974, Ser. No. 451,335
Int. Cl.² E04B 1/344; E04G 21/14
U.S. Cl. 52—70 19 Claims

1. A module for a building unit comprising:

a roof element defining a roof plane having first and second ends and being made of plate-like members having structural strength;

a side element defining a side plane;

first connecting means interconnecting said roof element and said side element for pivotal relative movement about a first axis in a manner such that they can be folded to be disposed parallel to each other;

second connecting means generally at the lower end of said side element for connecting them to a base to form a

building unit to swing from a folded position to an erected position about a second axis parallel to said first axis; and,

a panel member pivotally connected at one end thereof to said roof element between said first and second ends and adapted to pivot relative to said roof element about an axis parallel to said first and second axes, said panel member defining an interior partition plane adapted to extend generally vertically of said module and to be affixed to a floor element for retaining said panel member in the desired position.

3,953,948

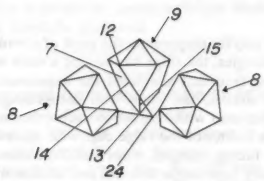
HOMOHEDRAL CONSTRUCTION EMPLOYING ICOSAHEDRON

John P. Hogan, 704 Elm, Williamsburg, Iowa 52361

Filed Sept. 3, 1974, Ser. No. 502,839

Int. Cl.² E04B *1/348*

U.S. Cl. 52—81 **37 Claims**



1. A structural framework in which the main structural elements comprise at least three icosahedral members, each icosahedral member being truncated about a vertex by the removal of five icosahedral faces about said vertex and at least one of said three icosahedral members being truncated about at least two non-adjacent, non-opposing vertex points, said truncated icosahedral members being joined along planes of truncation thus formed.

3,953,949

PREFABRICATED, MODULAR BUILDING STRUCTURE

John H. O'Sheeran, Box 178, c/o Milwaukee Shell Corporation, Plum City, Wis. 54761

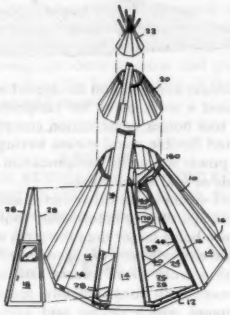
Filed Jan. 3, 1975, Ser. No. 538,245

Int. Cl.² E04B *7/08*

U.S. Cl. 52—82 **13 Claims**

1. A prefabricated, modular building structure of teepee form comprising:

a frusto-pyramidal base assembly including a floor assembly of regular polygonal form plan configuration, said floor assembly consisting of at least two sets of end-to-end abutting panels interconnected by integral male and female connectors along opposed edges thereof, said sets of panels being joined together along respective sides by floor beams to integral, interengaging male and female connectors extending along respective sides thereof, and said base assemblies further comprise side panels removably coupled to the peripheral edges of the floor assembly and extending upwardly and inwardly thereof, said side panels being trapezoidal in configuration and being affixed to said floor assembly along respective edges and being joined together by corner beams with the side edges of the corner beams and the side edges of the side panels being formed with integral male and female connectors respectively and being interengaged, at least a pyramidal



cap coupled to the upper end of said base assembly and acting as an extension thereof, said floor assembly comprising a regular polygon, said side panels at their bottoms being of a width correlated thereto and extending upwardly from respective side edges thereof and said corner beams being of shallow V-shaped cross-sectional configuration and being removably fixed to said base assembly side walls at respective corners of the polygonal floor assembly, a unitary frustopyramidal second stage shell resting its lower edge on the upper edge of the base assembly and receiving said pyramidal cap, and a threaded coupling extending through said second stage shell and being coupled at one end to said cap, and at the other end to a sealing disc spanning the upper end of said base assembly and having its periphery in engagement with the side panels of said base assembly below the area of contact between said base assembly and said second stage shell edges.

3,953,950

TRUCK BED LINER AND DOCK BUMPER COMBINATION

John R. Sudyk, Middlefield, Ohio, assignor to The Johnson Rubber Company, Middlefield, Ohio

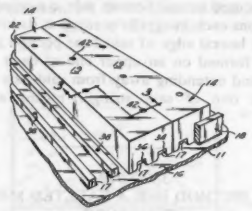
Division of Ser. No. 519,504, Oct. 31, 1974. This application June 16, 1975, Ser. No. 587,393

Int. Cl.² E02D *35/00*; **E04C** *2/32*

U.S. Cl. 52—127 **9 Claims**

1. A wear structure for a load surface subjected to heavy wear-type loading which is provided with an elongated mounting bar projecting from and secured to such surface comprising an elongated body of tough elastomeric material, an elongated metal reinforcing plate embedded in and bonded to said elastomeric material, said body being formed with a lengthwise channel adapted to fit over and mate with a mounting bar with one side of said plate overlying such bar, said plate being

formed with lateral skirt portions on both sides of said channel interlocking with said elastomeric material, and a plurality of



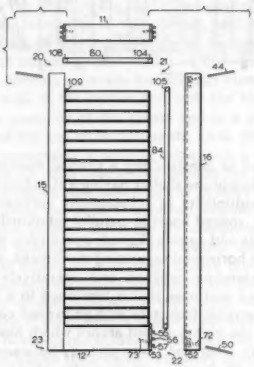
longitudinally spaced openings through said plate adapted to receive fasteners for securing said plate to the mounting bar.

3,953,951

WOOD PANEL DOOR

Harold R. Bushee, 501 Vineyard Road, NE., Albuquerque, N. Mex. 87113

Filed Sept. 30, 1974, Ser. No. 510,750
Int. Cl.² E06B 3/70, 3/74
U.S. Cl. 52—457 **2 Claims**



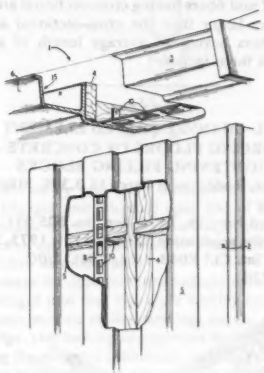
1. A door, comprising;
a pair of spaced parallel stiles, each having a mortise along an inside edge;
a pair of spaced parallel rails, each having at each end thereof a tenon to form a joint at a mortise adjacent an end of a respective stile, said rails having a mortise along an inside edge;
said pair of stiles and pair of rails joined at the corners to form a rectangle;
at least two horizontal rods at each of said joints, each located within a respective hole extending between said rail and said stile;
four elongated dowel rods, one located at each of said joints within a hole extending the entire width of said stile and into said rail, said elongated dowel rods which are located at the junctions at the bottom of the door being at an angle of approximately ten degrees from horizontal inwardly upwardly, and said two dowel rods which are located at the top joint being at an angle of approximately 10° from horizontal in a direction inwardly downwardly;
a center panel located within said rectangle, carried upon said rails and stiles;
said center panel comprising a plurality of boards arranged edge to edge, each board edge adjacent to another board edge comprising both a tongue and a groove parallel thereto to mate with the tongue and groove of the adjacent board, the grain structure of each of said boards being oriented with the grain opening in alternating facing directions of said panel to minimize warping of said panel;
said panel including a mortise formed around its border to align with the mortise formed within said stiles and said rails;
and four splines, each located within a respective mortise of said center panel and said rails and stiles to retain said center member within said rectangle.

3,953,952

CLADDING FOR BUILDING CONSTRUCTIONS AND METHOD FOR INSTALLING THE SAME

Samuel Middleby, Pacific Highway, Newcastle, New South Wales, Australia (2280)

Filed Sept. 16, 1974, Ser. No. 506,109
Int. Cl.² E04D 1/34
U.S. Cl. 52—511 **7 Claims**



1. A cladding adapted for installation on a skeleton frame of a building or the like comprising a sheet of material having an undulating cross section and a smooth weather surface on a first face thereof,
a glass fibre reinforced synthetic plastic layer formed on an opposite, second face of said sheet and a plurality of parallel channels defined thereon, by said undulating cross section,
a thin and continuous strip composed of a deformable metallic material lying in a parallel channel formed in the second face of each sheet, each strip having portions thereof at least partially embedded in said plastic layer, and
a plurality of tongue means closely spaced along the entire length of said strip and formed integrally therewith to normally lie on a longitudinal centerline of said strip and substantially in a plane thereof and bendable by light finger pressure out of said plane, whereby said tongue means may be selectively secured by nailing to transversely extending spaced frame members of a building and the cladding thereby tied in tension thereto.

3,953,953

CONCRETE REINFORCING ELEMENTS AND REINFORCED COMPOSITE INCORPORATING SAME

Winston Anthony Marsden, Abbotsford, Australia, assignor to Australian Wire Industries Proprietary Limited, Australia

Filed Nov. 27, 1973, Ser. No. 419,446

Claims priority, application Australia, Nov. 28, 1972, 1402/72

Int. Cl.[2] E04B 1/00

U.S. Cl. 52—659 4 Claims

1. Reinforcing fibers for castable matrix materials, each of said fibers comprising a shank portion of substantially uniform generally rectangular cross-sectional area, said shank having an average width of about 0.010 to about 0.06 inches and an average thickness of about 0.005 to about 0.03 inches, and raised projections extending from two opposite faces of the shank at each end of the fibers, each projection having a generally parabolic longitudinal cross-sectional elevation and a generally rectangular transverse cross-sectional elevation, the raised projections forming enlarged portions at each end of the shank of said fibers having cross-sectional areas at least about 1.5 times larger than the cross-sectional area of the shank, said fibers having an average length of about one-fourth to about three inches.

3,953,954

METAL U-CHANNEL SHAPED ELEMENT FOR REINFORCING FLOORS OF CONCRETE AND LIGHTENING FILLING BLOCKS

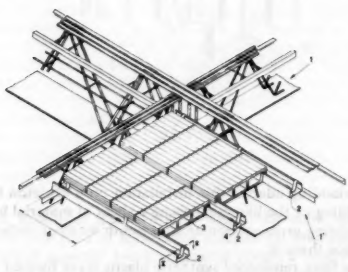
Salvatore Leone, Residenza al Parco 11.3.301, Milan 2, 20090 Segrate, Italy

Filed Nov. 19, 1974, Ser. No. 525,071

Claims priority, application Italy, Nov. 21, 1973, 31505/73

Int. Cl.[2] E04B 1/14; E04C 5/00

U.S. Cl. 52—720 8 Claims



1. A metallic construction channel element disposed on a longitudinal axis thereof and adapted to be structurally integrated into concrete floors and the like comprising:

an elongated, unbroken and hollow section of U-shaped cross section having a bottom side, a pair of upstanding side legs each integrally secured at its lower end to a respective lateral edge of said bottom side and stringer means integrally formed on an upper end of each of said side legs, said pair of stringer means having a composite bending strength at least equal to the bending strength of said bottom side and each of said stringer means being formed by at least one reverse bend formed on the upper end of a respective side leg to extend inwardly therefrom towards said axis, and

a plurality of U-shaped stiffening members spaced apart longitudinally along said axis and disposed within said section, each of said stiffening members having a base portion secured to said bottom side, a pair of upstanding side portions each integrally secured at its lower end to a respective lateral edge of said base portion and a flange integrally formed on an upper end of each of said side portions and extending away from said axis to overlie a respective one of said stringer means and secured thereon.

3,953,955

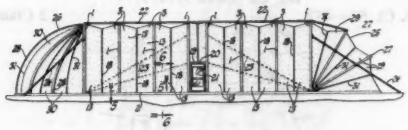
ERECTION METHOD FOR A VAULTED MEMBRANE STRUCTURE

Carl F. Huddle, Pleasant Ridge, Mich., assignor to Tension Structures Co., Pleasant Ridge, Mich.

Continuation-in-part of Ser. No. 323,539, Jan. 15, 1973, abandoned, which is a division of Ser. No. 93,293, Nov. 27, 1971, abandoned. This application Nov. 13, 1974, Ser. No. 523,459

Int. Cl.[2] E04G 21/14; E04B 1/32, 1/344, 1/347

U.S. Cl. 52—745 13 Claims



1. A method of constructing a vaulted membrane shelter, said vaulted membrane shelter having a structural frame comprised of a multiplicity of substantially vertical arches with curved bights, spaced apart in parallel relationship with their respective ends and apexes aligned, operatively mounted on a base to permit horizontal separating movement; a flexible roof membrane extending between and operatively attached to said arches and said base that is tensioned to a stiffened and substantially wrinkle-free state with an inward concave curvature between the bights of said arches which has a circumferential length in a vertical plane midway between said arches, that is at least 4% less than its circumferential length where it is operatively attached to adjacent vertical arches; means to fix said vertical arches in their erected position to maintain tension in said roof membrane, said method comprising the following steps:

a. assembling and disposing said arches on the base in recumbent positions with their corresponding ends aligned in their erected relationship, their crowns similarly oriented but spaced apart to facilitate attachment of said membrane,

b. prefabricating said membrane such that its circumference, in a vertical plane midway between said arches, is less than its circumference where it is operatively attached to said adjacent vertical arches,

c. operatively attaching said roof membrane to at least a portion of the crown of said arches,

d. raising the end arch, that swings away from the remaining arches, to an upright position which, in turn, partially raises at least one adjacent arch,

e. raising the opposite end arch of the shelter, or a section thereof, to an upright position,

f. moving said arches apart to their approximate erected position,

g. tensioning said roof membrane,

h. fixing said arches in space,

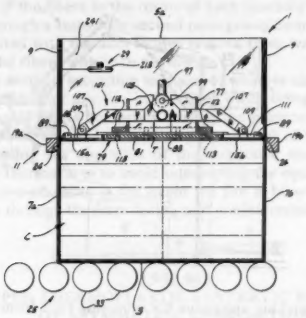
i. securing the lower portion of said membrane between the arches.

3,953,956

APPARATUS FOR FORMING FLAPS ON A CARTON

Burl Massman, Villard, Minn., assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Nov. 29, 1974, Ser. No. 528,231
Int. Cl.² B31B 1/14
U.S. Cl. 53—124 B 23 Claims



1. Apparatus for forming flaps at the top of an open-top carton after it has been packed, comprising means for internally scoring the walls of the carton generally at the level of the top of the contents of the carton, said scoring means comprising a set of scoring blades, one for each wall of the carton, means mounting said blades to fit in the carton with each blade extending generally horizontally along the inside of a respective wall of the carton and with the blades lying flat on top of the contents of the carton and in a plane generally at the level of the top of the contents, each blade having an outer edge constituting a scoring edge, and a set of presser members, one for each blade, surrounding the blades, means for effecting relative movement of the presser members and blades for scoring the walls of a carton disposed between the blades and the presser members by compressing the walls between said scoring edges of the blades and the presser members, and means for effecting relative movement of the carton and said scoring means to position the blades inside the carton on top of the contents of the carton with the blades lying flat on top of the contents in said plane and with the walls of the carton between the blades and the presser members, the latter and the blades then being relatively movable for compression of the walls between said scoring edges of the blades and the presser members to score the walls on the inside thereof generally at said level.

3,953,957

APPARATUS FOR FORMING CAULKING TUBE CARTRIDGES

Don R. Brothers, Canfield, and Edwin D. Stewart, Austintown, both of Ohio, assignors to Century Industries Corporation, New Waterford, Ohio

Division of Ser. No. 478,443, June 12, 1974, Pat. No. 3,886,711. This application May 23, 1975, Ser. No. 580,248
Int. Cl.² B65B 7/28; B67B 3/22
U.S. Cl. 53—329 1 Claim

1. Apparatus for simultaneously attaching (1) a two piece relatively movable plunger unit and (2) a protective cap to the opposite ends of a caulking tube cartridge,

said cartridge being cylindrical and formed from a material selected from the group consisting of paper and metal,

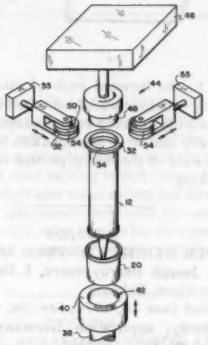
said cartridge having one end open and the opposite end closed by a nozzle and means rigidly mounting the nozzle in fluid tight communication with the interior of said cartridge,

said plunger unit comprising a flange ring and a plunger, said flange ring including a short cylindrical portion having an axis and a radially extending flange, said plunger being cup shaped with a bottom and cylindrical side wall and mounted coaxially with said flange ring, the cylindrical portion of the ring overlapping and frictionally engaging the cylindrical sidewall of the cup shaped plunger to thereby temporarily hold the two piece plunger unit together,

a cylindrical anvil member mounted for rotation about its axis and a piston member spaced from the anvil member and axially aligned therewith,

means for producing relative axial movement of the anvil and piston members,

means carried by said piston member for receiving said protective cap and pressing it into frictional engagement with both the nozzle and the means for rigidly mounting the nozzle,



means carried by said anvil member for forcing the two piece plunger unit into said open end of said cartridge,

power means for rotating the cartridge, plunger unit and protective cap as a unit while it is held between the anvil and piston members and

rolling means for deforming the radially extending flange of the plunger unit ring into tight locking engagement with the outer surface of the cartridge during rotation of the cartridge, said locking engagement having the property of locking the ring and cylindrical cartridge together against relative movement but allowing the cup shaped plunger to disengage from the ring and move toward the nozzle end of the cartridge upon application of axially directed outside force.

3,953,958

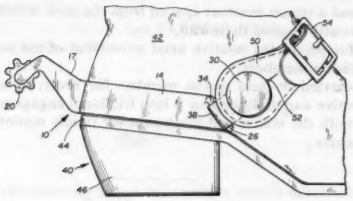
SPUR

Bud A. Beaston, Rte. 1, Box 13, Sperry, Okla. 74073

Filed Mar. 31, 1975, Ser. No. 563,313
Int. Cl.² A43C 17/00
U.S. Cl. 54—83 A 3 Claims

1. A spur for engagement with a boot of the type having an upper foot-engaging portion, an outer sole attached to the bottom of said upper portion and a heel attached to said boot at the rear of said outer sole, and wherein a groove is formed in said boot around the lower periphery of said upper portion by the inturned lower edge of said upper portion against said outer sole, comprising: a pair of forwardly directed arms connected at their rear ends in a curved portion to form a bell-shaped yoke; said yoke having an upwardly and inwardly inclined cross-section which is tapered convergently upwardly; said yoke having a rounded lower edge and a narrow rim projecting inwardly from said lower edge and adapted to be received in the groove of said boot above and surrounding said heel, said rim, at the rear portion thereof, projecting forwardly and inwardly merely to the extent of the depth of

said groove and, at the forward portions thereof, projecting inwardly to a lesser extent than the depth of said groove, the inner edge at the rear portion of said rim gradually tapering into the inner edges of said rim at the forward portions thereof; a pair of forwardly and upwardly directed ears pivot-



ally attached to the forward ends of said arms respectively along forwardly and downwardly directed hinge axes; each ear having an outwardly directed button adapted to engage a strap portion, whereby said strap portions can be fastened together above and forward of the instep portion of the boot to retain said spur thereon.

3,953,959

HEADER HEIGHT CONTROL MECHANISM

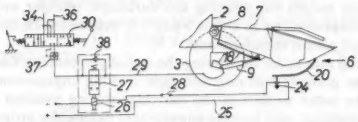
Trudo Marie Joseph Decruyenaere, L.De Boningestraat 39, B-8610 Wevelgem, Belgium

Filed June 10, 1974, Ser. No. 477,886

Claims priority, application Germany, June 14, 1973, 2330271; May 16, 1974, 2423841

Int. Cl.[2] A01D *67/00*

U.S. Cl. 56—208 **11 Claims**



1. In an agricultural harvester machine comprising a base unit and a header mounted thereon, a height control mechanism for said header comprising:

a. hydraulic means for adjustably supporting the header relative to the base unit, said hydraulic means including at least one hydraulic cylinder;

b. a hydraulic pressure fluid supply pump and a main control valve coupled to the hydraulic cylinder, the main control valve having a neutral position for maintaining fluid pressure at the level at which it is interrupted, a header lowering position for discharging fluid from said cylinder, and a header raising position for supplying fluid to said cylinder;

c. header weight compensation means operably associated with said hydraulic means and operable to enable the header to float over ground irregularities;

d. one or more ground sensing members mounted on the header and operably associated with said hydraulic means; and

e. means for selectively controlling the drainage of hydraulic fluid from said hydraulic means, said selective control means including shut-off means between the main control valve and the hydraulic cylinder, the shut-off means being operable to interrupt drainage of hydraulic fluid from the hydraulic cylinder as soon as at least one ground sensing member engages the ground.

3,953,960

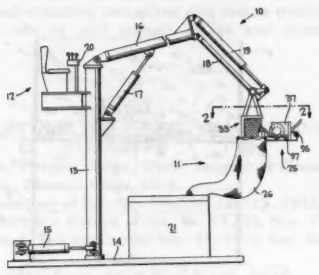
FRUIT PICKING APPARATUS

William E. Craven, Rte. 6, Laurel, Miss. 39440

Filed Aug. 9, 1974, Ser. No. 496,302

Int. Cl.[2] A01D *46/24*

U.S. Cl. 56—328 R **10 Claims**



1. A fruit picking apparatus for removing fruit from a tree comprising:

a picker head;

a frame on said picker head;

a picker roll mounted for rotation on said frame, said roll including a plurality of segment wheels having outer fruit engaging surfaces;

drive means on said head connected to said roll;

a plurality of fruit engaging fingers on said frame spaced from said fruit engaging surfaces on said wheels, said fingers being in alignment with said wheels and curved to be substantially conforming therewith for cooperation to engage the fruit in channels formed therebetween; and

resilient means on said head for relatively urging said fingers and said roll toward each other, whereby resilient engagement of the fruit and multiplanar rotation is provided for removing the fruit.

3,953,961

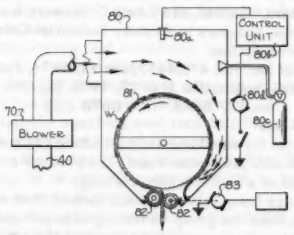
METHOD AND APPARATUS FOR SPINNING YARNS ON OPEN-END SPINNING MACHINES AND PNEUMATICALLY REMOVING FIBER AND TRASH WASTE INCIDENT TO SPINNING

John Harrap, Prestbury, and Richard Gordon Stewart, Heaton Mersey, both of England, assignors to Parks-Cramer (Great Britain), Ltd., Oldham, England

Continuation-in-part of Ser. No. 409,055, Oct. 24, 1973, which is a continuation-in-part of Ser. No. 366,963, June 4, 1973, abandoned. This application July 5, 1974, Ser. No. 485,773

Int. Cl.[2] A62C *3/04*; **B08B** *5/04*; **D01H** *1/12*, *11/00*

U.S. Cl. 57—56 **69 Claims**



1. A method of spinning yarns while removing fiber waste from yarn spinning rotors of a group of open-end spinning machines and also removing trash waste liberated from fibers

in their paths of travel to the respective rotors, said method comprising producing a primary airflow through a duct to draw air past the rotors of each machine in the group and through a respective first passageway communicatively connected with the duct to remove fiber waste from the rotors of each machine in the group with such airflow, and while causing such primary airflow to also draw air adjacent the paths of travel of the fibers to the rotors of each machine in the group and through a respective second passageway communicatively connected with the duct to also remove trash waste liberated from the fibers with such airflow.

7. A method according to claim **6**, wherein said sensing of the presence of any fire in the fiber waste being arrested by any of said filters comprises sensing the presence of any fire for a predetermined relatively short interval of time prior to interrupting the operation of the respective machine in response thereto so as to avoid interrupting the operation of the respective machine in the event the fire is blown out by the airflow through the filter during said predetermined interval of time.

3,953,962

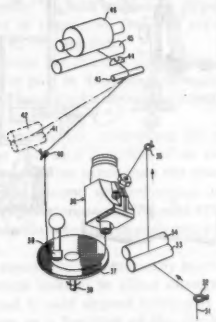
CRIMPED THERMOPLASTIC SYNTHETIC FILAMENTS OF ASYMMETRIC COMPOSITION

Alvin L. Breen, deceased, late of Wilmington, Del.; by Richard D. Breen, administrator, Kennett Square, Pa., and Herbert G. Lauterbach, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 721,403, April 15, 1968, Pat. No. 3,854,177, which is a continuation-in-part of Ser. No. 43,897, July 19, 1960, abandoned, which is a continuation-in-part of Ser. No. 698,103, Nov. 22, 1957, abandoned. This application Dec. 13, 1974, Ser. No. 532,611

Int. Cl.² D02G *3/02*

U.S. Cl. 57—140 R **2 Claims**



1. A thermoplastic synthetic linear polymer yarn composed of substantially continuous, individually crimped filaments having a random, three-dimensional, curvilinear, extensible configuration continuously along the filament length and having an asymmetric composition across the filament width.

3,953,963

ELECTRONIC DIGITAL DISPLAY TIMEPIECE CORRECTION DEVICE

Izuhiko Nishimura, and Masuo Tsuji, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Suwa, Japan

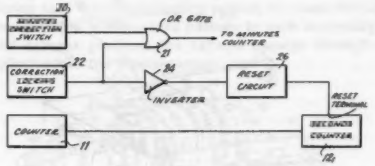
Filed Aug. 9, 1974, Ser. No. 496,250

Claims priority, application Japan, Aug. 9, 1973, 48-89481

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 R **12 Claims**

1. In an electronic timepiece having a quartz crystal oscillator circuit producing a high frequency time standard signal a divider circuit including a plurality of divider stage means adapted to produce low frequency timekeeping signals in response to said high frequency time standard signal, and display means associated with said plurality of divider stage means to display digits of time in response to said low frequency timekeeping signals, correction means including a plurality of correction switch means associated with certain of said plurality of divider stage means producing timekeeping signals, the improvements comprising locking switch means coupled intermediate each said correction switch means and each of said divider stage means having a correction switch



means associated therewith, said locking switch means being adapted to be operated from a locking mode to a release mode to thereby permit the selective correction of the count of said certain divider stage means by said correction switch means associated therewith, said locking switch means being coupled to at least one of said divider stage means not having a correction switch means associated therewith for controlling the operation of said divider stage means by the operating of said locking switch means between a release mode and a locking mode.

3,953,964

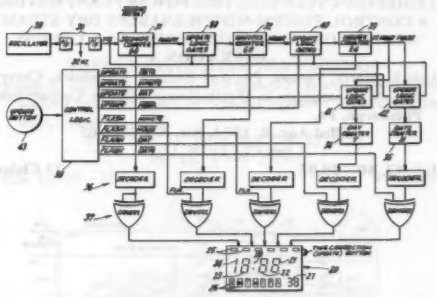
SINGLE SWITCH ARRANGEMENT FOR ADJUSTING THE TIME BEING DISPLAYED BY A TIMEPIECE

Paul Suppa, Somers, N.Y., and Alan E. Willis, Stamford, Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed Feb. 13, 1975, Ser. No. 545,846

Int. Cl.² G04B *19/30*; **G04C** *3/00*; **G04B** *27/00*

U.S. Cl. 58—50 R **6 Claims**



1. An electronic timepiece comprising:

an electrooptical display means having a plurality of indicia thereon for separately indicating different time intervals;

a timekeeping circuit means coupled to said display means for actuating each indicia to visually display time information;

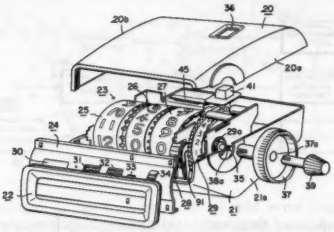
a manually operated switch having a single manually operated actuator; and

circuit means operated by said switch and coupled to the timekeeping circuit means and to the display indicia for effecting sequential and separate distinction of the indicia and for effecting separate and selective adjustment of the time information being displayed thereby by the single manually operated actuator being manually operated in a prescribed manner.

3,953,965
DIGITAL CLOCK

Kanji Tobeta, Tokyo, Japan, assignor to Kabushiki Kaisha Tamura Denki Seisakusho, Tokyo, Japan

Filed Nov. 8, 1974, Ser. No. 522,032
Claims priority, application Japan, Oct. 18, 1974, 49-120715
Int. Cl.² G04B *13/02*; G04C *21/18*; G04B *29/02*, *19/02*
U.S. Cl. 58—125 C 3 Claims

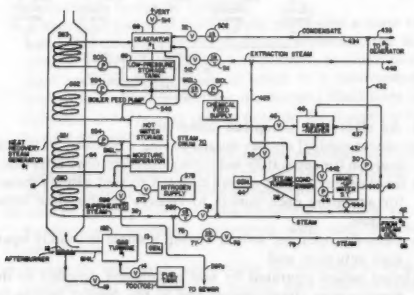


1. A digital clock having a plurality of time display drums fitted side by side to a shaft bridged across the frame, a plurality of shift pinions supported by the frame, each of which is disposed between adjacent time display drums, an electric motor attached to the frame and a plurality of gears for transmitting the rotary motion of the motor to the time display drums and a plurality of timer members attached to the frame and related to the rotary motion of a drive member driven by said motor, wherein a plastic mounting plate and a plastic holding plate constituting a side wall of the frame and being disposed in parallel, are provided which are comprised of a plurality of shafts being integrally moulded on said plates and rotatably supporting said gears for driving the time display drums, and means for supporting and guiding said timer members, said means being integrally moulded on said plates.

3,953,966
COMBINED CYCLE ELECTRIC POWER PLANT HAVING A CONTROL SYSTEM WHICH ENABLES DRY STEAM GENERATOR OPERATION DURING GAS TURBINE OPERATION

Lyle F. Martz, Verona, Pa., and Richard J. Plotnick, Cherry Hill, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,765
Int. Cl.² F01K *23/10*
U.S. Cl. 60—39.02 33 Claims



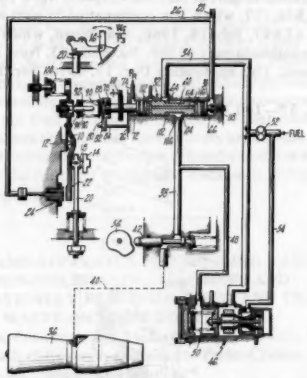
24. A control system for a combined cycle electric power plant comprising at least one gas turbine including an exit through which heated exhaust gases pass, means for generating steam coupled to said gas turbine exit for transferring heat from the exhaust gases to a fluid passing through said steam generating means, a steam turbine coupled to said steam generating means and driven by the steam supplied thereby, means for generating electric power by the driving power of said turbines, condenser means for receiving and converting the spent steam from said steam turbine into condensate, and said steam generating means comprising a low pressure storage tank, a first heat exchange tube, a boiler feedwater pump for directing fluid from said low pressure storage tank through said first heat exchange tube, a main storage drum, a second heat exchange tube, and a high pressure recirculation pump for directing fluid from said main storage pump through said second heat exchange tube, said control system comprising:

monitoring means for measuring the temperature of the exhaust gas turbine gases as directed to said steam generating means and responsive to such a temperature above a predetermined level, for deactuating said steam turbine.

3,953,967
SERVOED THROTTLE VALVE FOR FUEL CONTROLS

Lawrence S. Smith, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 18, 1975, Ser. No. 559,477
Int. Cl.² F02C *9/10*
U.S. Cl. 60—39.28 R 9 Claims



7. For a fuel control for a turbine type power plant in which fuel is scheduled by multiplying W_f/P_3 by P_3 (where W_f/P_3 is a ratio unit established by certain engine operating parameters and P_3 is actual compressor discharge pressure or a function thereof) a force balance multiplication lever system including a fulcrumed lever and a positional lever slidably mounted relative thereto, a servo system including a flapper valve operatively connected to said multiplication lever system for controlling a metering valve for controlling fuel flow to said power plant, the improvement comprising means for maintaining the pressure in said flapper valve constant, said means including combined piston and metering valve having a spool element rotatably mounted in a cylinder adjacent a drain cavity and having opposite faces being fluid reaction surfaces, said flapper adjusting the flow of servo fluid adjacent one of said reaction surfaces for positioning said combined piston and metering valve rectilinearly, and means disposed in said drain cavity portion remote from said one of said reaction surfaces for imparting rotary motion to said combined piston and metering valve.

3,953,968

APPARATUS AND METHOD FOR GOVERNING SPEED AND ACCELERATION OF A GAS TURBINE SYSTEM

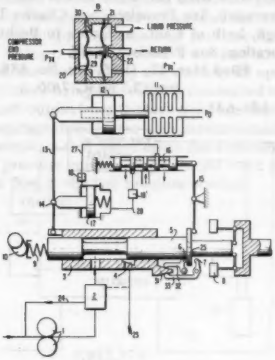
Wilhelm Jurisch, Nellingen, Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Germany

Filed Aug. 31, 1973, Ser. No. 393,274

Claims priority, application Germany, Aug. 31, 1972, 2242901

Int. Cl.² F02C *9/10*

U.S. Cl. 60—39.28 R **21 Claims**



10. Apparatus for governing the speed and acceleration of a gas turbine engine system of the type having a combustion air compressor and a gas turbine on a common shaft and a combustion chamber; said apparatus comprising:

fuel supply valve means for directly controlling the amount of fuel supplied to said engine in dependence on the displacement of respective first and second valve parts with respect to one another,

first control means for directly controlling the position of said first valve part in dependence on the speed of said common shaft and the position of a controllable selector member,

second control means for controlling the position of said second valve part as a function of an engine operating parameter index value other than the speed of said common shaft, said second control means including a mechanical linkage interconnecting said second valve part with a mechanism movable in response to change in said index value,

and trimming means for automatically moving a portion of said mechanical linkage to effect changes in the movement imparted to said second valve part by said second control means as a function of the displacement of the first valve part,

wherein said first control means includes a governor engageable with one end of said first part, and wherein said controllable selector member engages the other end of said first part by way of a resilient member.

3,953,969

SYSTEM FOR PURIFYING EXHAUST GAS OF A SPARK IGNITION TYPE FOUR STROKE INTERNAL COMBUSTION ENGINE

Haruo Mori, Tokyo, and Yukio Mizuno, Tachikawa, both of Japan, assignors to Fuji Heavy Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 259,522, June 5, 1972, abandoned. This application May 1, 1974, Ser. No. 465,946

Claims priority, application Japan, June 5, 1971, 46-39543

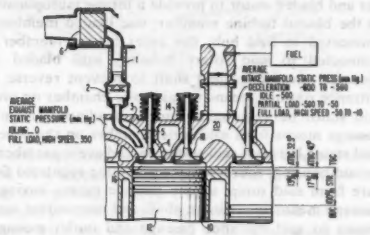
Int. Cl.² F02B *75/10*

U.S. Cl. 60—293 **2 Claims**

1. A system for purifying the exhaust gas of a spark ignition type, four stroke multi-cylinder internal combustion engine, said engine including: intake and exhaust valves within intake and exhaust passages respectively for each cylinder for controlling the fuel-air mixture and exhaust gas to and from the engine cylinder, respectively, said system comprising:

secondary air supply means,

means for providing a valve-overlapping period at the end of the exhaust stroke for the intake and exhaust valves of respective cylinders extending from **60°** to **90°** of crank angle and divided generally equally to each side of piston top dead center so that the pressure in the exhaust gas passage of the engine for said cylinders becomes negative during said valve overlapping period, to cause the negative pressure in the intake passage to such secondary air and exhaust gas from the exhaust passage through the cylinder into the intake passage, and



means for supplying said secondary air to the exhaust gas passage of the engine when the pressure in the exhaust gas passage is lower than atmospheric pressure during said valve-overlapping period,

whereby; the exhaust gas in the exhaust passage flows backwards across the combustion chamber and into the intake passage of the engine together with secondary air and the mixture of the exhaust gas and the secondary air is first subjected to mixing with the primary air and fuel mixture in the intake passage to preheat the primary air and fuel mixture and is secondly subjected to recombustion within the combustion chamber of the engine together with the preheated, fresh mixture of fuel and primary air.

3,953,970

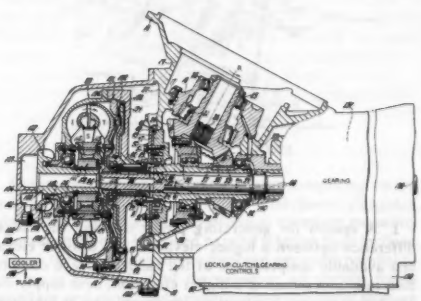
TORQUE CONVERTER TRANSMISSION

Reece R. Fuehrer, Danville, and James F. Hartz, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 21, 1975, Ser. No. 551,833

Int. Cl.² F16D *33/00*

U.S. Cl. 60—337 **19 Claims**



1. In a transmission; a housing having a main housing portion and a torque converter housing portion having a support wall spaced from said main housing; a sleeve shaft rotatably

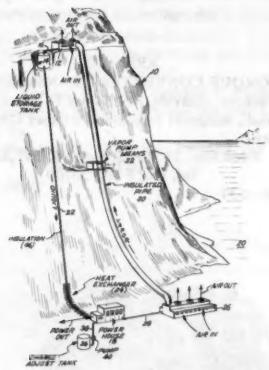
supported in said main housing portion and extending into said torque converter housing portion; an inner shaft rotatably supported in said sleeve shaft and extending into said torque converter portion; a ground member having a ground shaft nonrotatably mounted on said support wall and extending toward said sleeve and inner shafts; a rotary torque converter housing enclosing an annular chamber having axially spaced side walls with one side wall having bearing means rotatably mounted on said ground shaft and the other side wall having drive connecting means drive connected to said sleeve shaft; a hub member positioned adjacent said other side wall and drive connected to said inner shaft; torque converter means including a bladed impeller member, a bladed turbine member and a bladed stator arranged to provide a toric chamber and during rotation of the bladed impeller member circulating fluid in a toroidal flow path through the bladed turbine member and bladed stator to provide a torque multiplication drive to the bladed turbine member; one bladed member is drive connected to said hub; the other bladed member is drive connected to said rotary housing; said bladed stator is mounted on said ground shaft to prevent reverse rotation; entrance passage means to said toric chamber on one side of said stator between said stator and adjacent member; exit passage means from said toric chamber on the other side of said stator between said stator and adjacent member; a sump in said housing; source means providing regulated fluid pressure from said sump; supply passage means having transfer passage means including a shaft and connecting said source means to said entrance passage and outlet passage means having transfer passage means including a shaft and connecting said exit passage through said transfer passage means to said sump.

3,953,971

POWER GENERATION ARRANGEMENT

Sidney A. Parker, 5820 Diamond Oaks Drive South, Fort Worth, Tex. 76117

Filed Jan. 2, 1975, Ser. No. 538,011
Int. Cl.² F03G 7/04
U.S. Cl. 60—641 **41 Claims**



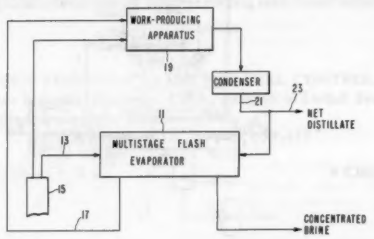
1. A system for generating power utilizing the elevation difference between a higher elevation and a lower elevation and available temperatures of the earth's surface comprising heat rejection means at a higher elevation, heat supply means at a lower elevation, power generation means at substantially the same level as the heat supply means between the heat rejection means and the heat supply means, relatively small diameter conduit means communicating the heat rejection means and the power generation means and the heat supply means respectively, and relatively large diameter insulated conduit means communicating the heat supply means with the heat rejection means, whereby fluid flowing through the relatively small diameter conduit means will actuate the power generation means and be cooled, and the cooled fluid will absorb heat from the heat supply means and flow to the heat rejection means.

3,953,972

GEOTHERMAL ENERGY RECOVERY PROCESS

Leon Awerbuch, San Francisco, and Charles T. Draney, Hillsborough, both of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Filed Mar. 17, 1975, Ser. No. 558,974
Int. Cl.² F03G 7/00
U.S. Cl. 60—641 **33 Claims**



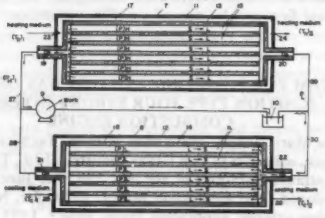
1. In a system for using the heat energy from the brine from a geothermal well: a multi-stage flash evaporator of the direct contact type having inlet means at one end thereof for receiving a distillate and outlet means at the opposite end thereof for allowing a fluid including said distillate to be discharged therefrom; means coupled with said outlet means for placing the flash evaporator in fluid communication with a fluid-actuated, work-producing apparatus, whereby the fluid can be directed to said apparatus for actuating the same; and means coupled with the evaporator for connecting the same to a geothermal well so that brine therefrom can be directed into the evaporator, the latter having means for directing the brine in countercurrent, heat transfer relationship to the flow of distillate therethrough.

3,953,973

HEAT ENGINE AND HEAT PUMP UTILIZING A WORKING MEDIUM UNDERGOING SOLIDIFICATION AND MELTING OPERATIONS

Chen-yen Cheng, 9605 La Playa St., NE., Albuquerque, N. Mex. 87111, and Sing-Wang Cheng, Fourth Floor, No. 1, Lane 479, Fu-Hsing North Road, Taipei, China /Taiwan

Filed May 29, 1974, Ser. No. 474,317
Int. Cl.² F03G 7/06
U.S. Cl. 60—671 **5 Claims**



1. A system containing a working medium undergoing a cyclic process which comprises a first step of removing heat

energy from a heat source at a first temperature and a second step of releasing heat energy to a heat sink at a second temperature and has work interaction with its surrounding, wherein the system comprises of a quantity of a working medium which may be melted under a first pressure as it removes heat at the said first temperature and be solidified under a second pressure as it releases heat at the said second temperature, and be denoted as the S/L medium, a pressure container of such strength to sustain both the said first pressure and the second pressure and having a first opening and a second opening, the S/L medium being contained in the pressure container, means for deriving a work output from the high pressure fluid and a liquid medium storage, a high pressure conduit and a low pressure conduit, the first opneing and the second opening of the pressure container being respectively connected to means for deriving a work output from the high pressure fluid and the liquid medium storage through the high pressure conduit and low pressure conduit, a first valve mean for controlling fluid flow in the high pressure conduit and a second valve mean for controlling fluid flow in the low pressure conduit.

3,953,974

IMPERVIOUS BARRIER COMPRISING POLYOLEFIN FABRIC, ASPHALT AND ASBESTOS

Clarence R. Bresson, and Forrest D. Spaulding, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 207,800, Dec. 14, 1971, Pat. No. 3,864,157. This application Oct. 31, 1974, Ser. No. 519,693

Int. Cl.² B32B *5/14, 11/02, 11/10;* **E02B** *5/02*

U.S. Cl. 61—1 R **9 Claims**

1. A fluid retentive container comprising a supporting mass lined with an impervious cover structure which comprises a nonwoven polyolefin fabric, mat or web, fused externally on one side and placed with that side against said mass and having unfused fiber on the other external side, the unfused fibrous side being coated with a mixture containing asphalt and asbestos fibers.

8. A cover structure according to claim 1 wherein the fabric was made by fusing both major faces of a nonwoven polyolefin fabric, mat or web, thereafter capping one of the fused faces with a layer of unfused fibers, and then coating the layer of unfused fibers with a mixture of asphalt and asbestos fibers.

3,953,975

PREVENTION OF SUBSURFACE SEEPAGE BY ACRYLIC ACID POLYMERS

William R. Busler, Park Forest, and Donald G. Robinson, Clarendon Hills, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 12, 1975, Ser. No. 549,266

Int. Cl.² E02B *3/02*

U.S. Cl. 61—1 R **14 Claims**

1. A method of seepage control for bodies of non-flowing water in contact with porous substrata, which comprises contacting said porous substrata with from 0.001 to 1.0 percent by weight of an acrylic acid polymer, said polymer having at least 20 percent by weight of an acrylate group, said contacting being made by adding the acrylic acid polymer to the body of water in contact with said porous substrate.

3,953,976

SELF-SUPPORTING WALL

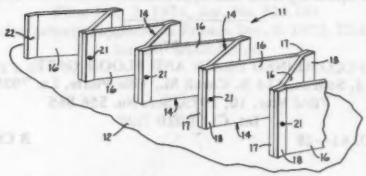
George J. Morren, Ottawa County, and Neil R. Berndt, St. Joseph, both of Mich., assignors to Speidel Foundation & Marine, Inc., Benton Harbor, Mich.

Continuation of Ser. No. 345,492, March 29, 1973, Pat. No. 3,820,343. This application May 20, 1974, Ser. No. 471,497

The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.

Int. Cl.² E02B *3/04*

U.S. Cl. 61—4 **8 Claims**



1. In a self-supporting sea wall construction adapted to be positioned on a support surface, such as the ground, the improvement comprising:

a plurality of prefabricated upright wall segments connected in series with one another and defining a zig-zag shape, the individual wall segments being of a rigid and unitary structure, said wall segments also being relatively heavy so that the wall construction can withstand imposition of substantial forces on the sides thereof; and

pivot means connecting the adjacent upright wall segments together for enabling continuous relative pivotal movement between said adjacent wall segments about a pivot axis which extends in a direction substantially parallel to the longitudinally extending direction of said wall, said pivot means permitting the individual wall segments to substantially conform to the supporting surface.

3,953,977

DEVICE FOR DAMPING WAVES

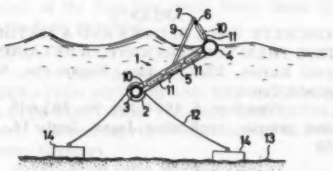
Keizo Kikui, Kamagaya, and Michio Sasaki, Funabashi, both of Japan, assignors to Mitsui Shipbuilding and Engineering Co. Ltd., Tokyo, Japan

Filed July 11, 1974, Ser. No. 487,646

Claims priority, application Japan, July 16, 1973, 48-80170

Int. Cl.² E02B *3/06*

U.S. Cl. 61—5 **2 Claims**



1. Device for damping seawater waves comprising an inclined frame constructed with upper and lower elongated floating members and a plurality of spacer members mounting said floating members in spaced parallel relation in an inclined plane with the floating members disposed generally parallel to the waves at the surface of the seawater, an upright frame mounted on and projecting upwardly from the upper floating member and having a plane perpendicular to the plane of said inclined frame, said upright frame including a top member spaced from said upper floating member and side members connecting said top member with said upper floating member, a plurality of inclined and upright barrier elements comprising

annular elements secured to and mounted between said members respectively in the planes of said inclined frame and said upright frame, said barrier elements being mounted in their respective planes with gaps therebetween to permit passing of seawater through said frames, and mooring means for connecting the inclined frame to the sea bottom extending forwardly and rearwardly from said lower member and being of a length to maintain said lower floating member submerged at a depth below the surface to permit said upper floating member to float at the surface so that the inclined frame is downwardly sloped against the waves in the seawater and the upright frame is positioned at the surface of the seawater to project upwardly from said upper member.

3,953,978

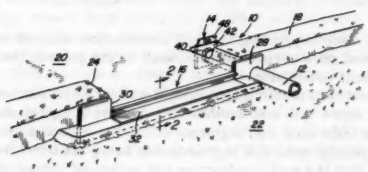
COMBINED DRAIN AND FLOOD GATE

Hosea J. Soileau, 614 N. Coreil St., Ville Platte, La. 70586

Filed Mar. 10, 1975, Ser. No. 556,865

Int. Cl.² E02B 7/20

U.S. Cl. 61—28 **8 Claims**



1. A flood gate for use in combination with a levee separating an upper land surface area from an adjacent lower land surface area for controlling flow of water from the upper area to the lower area, said flood gate comprising a vertically disposed, elongated support member extending across an opening in the levee and forming a closure therefor to prevent water flow through the levee, said support member including a recess in the top edge thereof defining a passageway for passage of water from the upper area to the lower area, and a vertically movable panel mounted on the support member and extending throughout the length of the recess for forming a vertically movable closure for the recess for controlling the level of water retained in the upper area thereby maintaining a desired depth of water in covering relation to the upper land area, and controllable drainpipe means extending through the levee and one end portion of the support member for complete drainage of water from the upper area to the lower area.

3,953,979

CONCRETE WALL BLOCKS AND A METHOD OF PUTTING THEM TOGETHER INTO A RETAINING WALL

Masayuki Kurose, 2208 Kodago, Nagayo-cho, Nishisonogi, Nagasaki, Japan

Filed Sept. 6, 1974, Ser. No. 503,635

Claims priority, application Japan, Sept. 14, 1973, 48-104250

Int. Cl.² E02D 5/20; E02B 3/14

U.S. Cl. 61—39 **2 Claims**

1. A block for use in the construction of a retaining wall, said block having a longitudinal axis and comprising:

a generally vertical first wall having a rectangular vertical cross-section transversely to said longitudinal axis of said block;

a generally vertical second wall disposed opposite to said first wall and parallel thereto and having a rectangular vertical cross-section transversely to said longitudinal axis of said block;

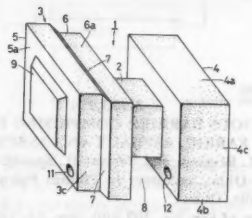
a horizontal member interconnecting said first and second walls approximately in the centers thereof and having a rectangular cross-section transversely to said longitudinal axis of said block, said cross-section of said horizontal member being smaller than said cross-sections of said first and second walls;

said first wall having an inner portion connected to said horizontal member, an outer portion adapted to form an exposed surface portion of said retaining wall, and a middle portion interposed between said inner and outer portions;

said inner portion having a pair of horizontal surfaces lying in the respective horizontal planes of a pair of horizontal surfaces of said second wall and a pair of vertical surfaces lying in the respective vertical planes of a first pair of vertical surfaces of said second wall which are parallel to said longitudinal axis of said block, said inner portion further including a third vertical surface which is perpendicular to said longitudinal axis of said block and to which said horizontal member is connected at one end;

said second wall having a second pair of vertical surfaces perpendicular to said longitudinal axis of said block, said horizontal member being connected at the other end to one of said second pair of vertical surfaces;

said first wall middle portion being defined by a pair of horizontally extending flat surfaces and a pair of vertically extending flat surfaces which are all inclined at an equal angle to said longitudinal axis of said block, whereby said first wall outer portion is diagonally offset relative to said inner portion;



said first wall outer portion having a vertical surface located on the opposite side of said middle portion from said third vertical surface of said inner portion;

said vertical surface of said outer portion having a flat, rectangular outwardly tapered boss perpendicular to said longitudinal axis of said block;

the other of said second pair of vertical surfaces of said second wall being provided with an inwardly tapered, rectangular recess which is complementary to said boss and is horizontally alignable therewith, said boss and said recess extending along said longitudinal axis of said block and lying substantially in a common horizontal plane with said horizontal member;

said first wall having a drain hole extending through said inner, middle, and outer portions and parallel to said longitudinal axis of said block; and

said second wall having a drain hole extending therethrough coaxially with said drain hole of said first wall.

3,953,980

DOCK STRUCTURE

Gerald B. Bennett, Clarkston, Mich., assignor to Floyd William Bennett, Clarkston, Mich.

Filed Jan. 13, 1975, Ser. No. 540,725

Int. Cl.² E02B 3/20

U.S. Cl. 61—48 **8 Claims**

1. A structure for a dock at a shoreline site comprising:

a pair of vertical support members, each having its base anchored at a point proximate the shoreline;

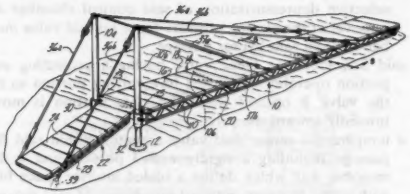
a slidable locking collar mounted on each of said vertical members for upward and downward adjustment;

a deck for the dock having one end connected to said collars for vertical adjustment therewith and having its other

free end extending outwardly over the surface of the adjacent water;

one of said collars being releasable from said deck and the other being rotatably movable about its associated vertical member to provide for movement of the dock in a horizontal plane between a use position and a storage position substantially aligned with the shoreline;

a pair of support cables, each journaled for slidable movement across the top of a different one of said vertical members, said cables connected at their first ends respectively to the deck intermediate its ends and at their second ends to an anchoring means in the shore spaced away from the vertical members; and



an adjusting means comprising a threaded means operably connected to each of the cables intermediate the anchoring means and said vertical members for providing the tightening or loosening of its associated cable to provide selected raising and lowering of the dock;

said deck adjustable by said adjusting means between, first, a lowered position in which its free end is dropped into contact with the ground beneath the surface of the water to provide a launching function, second, a position substantially level but spaced from the surface of the water for use as a dock structure and, third, a raised or storage position with the free end elevated above the surface of the water.

3,953,981

CONNECTING COMPONENTS FOR PILES

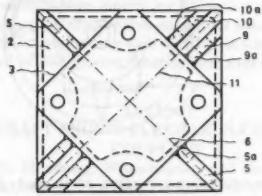
Bengt Axelsson, Norrahammar, and Gunnar Albert Axgarde, Stockholm, both of Sweden, assignors to Parca-Norrahammar AB, Norrahammar, Sweden

Filed May 28, 1974, Ser. No. 474,067

Claims priority, application Sweden, May 28, 1973, 7307486

Int. Cl.² E02D *5/34, 7/00*

U.S. Cl. 61—53 **3 Claims**



1. A pile joint comprising a pair of complementary connecting components, each component having male and female elements and a support surface for face to face engagement between the complementary components; the male elements being constituted of plate-type parts protruding substantially perpendicularly on the support surface, and the female elements being constituted of a pair of parallel cheeks protruding substantially perpendicularly on the support surface, said female elements being adapted to receive therebetween either one of the male elements on the complementary component, when the components are placed into the face to face engagement, the plate-type parts being extended along one diameter of the support surface, and the cheeks extended on either side of another diameter crossing the first diameter perpendicularly, and each plate-type part and each cheek having through holes co-axially coinciding in each pair of a male and female element, and a locking shaft inserted in the holes.

3,953,982

METHOD AND APPARATUS FOR LAYING AND CONNECTING FLOW LINES TO SUBMERGED STRUCTURES

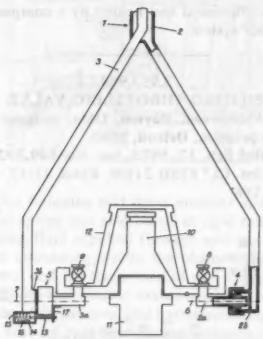
Michael D. Pennock, Pinner, England, assignor to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed Dec. 3, 1974, Ser. No. 529,181

Claims priority, application France, Dec. 5, 1973, 73.43469

Int. Cl.² F16L *35/00*

U.S. Cl. 61—72.3 **23 Claims**



1. A method of laying and connecting a flow line to a submerged base structure, wherein an end portion of the line to be connected to the submerged base structure has an albow portion, and a connection at the end of the elbow portion, said connection being capable of pivoting about the axis of the elbow portion and forming part of a basic structure for vertical connection to the submerged base structure, the method comprising the steps of a) holding the basic structure fixed relative to the end portion of the flow line by operation of a locking apparatus rigidly connecting the elbow portion to the connection; b) progressively submerging the flow line in alignment with the submerged base structure until the basic structure coincides with connecting means on the submerged base structure; and, c) unlocking the locking apparatus so that the elbow portion of the flow line pivots freely about its axis relative to the basic structure.

3,953,983

REFRIGERATION METHOD AND REFRIGERATING APPARATUS FOR CARRYING OUT THE METHOD

Ernst Sander, Weissenburg, Germany, assignor to Friedrich Knopsmeier, Germany

Filed Apr. 8, 1974, Ser. No. 459,223

Claims priority, application Germany, Oct. 13, 1973, 2351516

Int. Cl.² F25B *27/02*

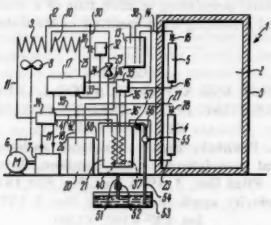
U.S. Cl. 62—79 **27 Claims**

1. Refrigeration method comprising:

placing a compressor refrigerating system and an absorber refrigerating system having respective separate closed circuits in operative relationship with respect to one another such that a coolant from the compressor system is usable for cooling a refrigerant of the absorber system,

and alternatingly operating the compressor and absorber systems to cool a common container with refrigerant store of the absorber system being replenished during

operation of the compressor system by boiling out refrigerant from an absorber composition utilizing heat from



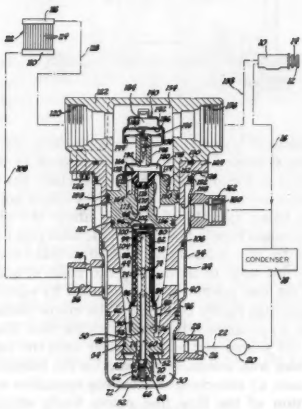
coolant compressed and heated by a compressor of said compressor system.

3,953,984

PILOTED THROTTLING VALVE

Richard E. Widdowson, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 12, 1975, Ser. No. 549,392
Int. Cl.² F25D *21/00*; F16K *31/12*
U.S. Cl. 62—156 **2 Claims**



1. A bypass type control valve for an air conditioning system having an evaporator and a compressor comprising:

a valve housing defining a flow passage with an inlet adapted to be fluidly connected to the evaporator and an outlet adapted to be fluidly connected to the compressor;

said housing further having a bypass passage with an inlet fluidly connected to compressor and an outlet fluidly connected to the evaporator for passage of warm fluid from the compressor directly to the evaporator to increase the evaporator temperature;

said bypass passage having a valve seat therein and a valve member coacting therewith to regulate the flow of warm fluid therethrough;

said valve member having a central portion with a valving surface thereon to engage said valve seat and a thin walled and resilient peripheral edge portion extending integrally therefrom and supported at a radially outer edge by said housing to permit movement of said central portion with respect to said outer edge, thereby controlling fluid flow through said bypass;

enclosure forming means including a member extending in overlying relation to one side of said valve member defining a pressure control chamber on said one side of said valve member and having a bleed passage formed therein connecting said control chamber with said flow passage;

said valve member having a restricted aperture extending through said peripheral edge portion of said valve member fluidly connecting said control chamber with the compressor to pressurize said control chamber and create a closing force on said valve member, thus blocking fluid flow through said bypass passage;

a Schrader-type bleed valve supported by said enclosure forming means in said bleed passage and regulating the flow of fluid from said bypass inlet, through said aperture and said control chamber to said flow passage to permit selective depressurization of said control chamber and removal of the closing pressure force on said valve member to open said bypass passage;

said Schrader-type bleed valve having a projecting stem portion operably connected to a valving portion so that the valve is opened when the stem portion is moved inwardly toward the valve;

a temperature sensor and valve actuator within said flow passage including a rigidly walled portion and a thin, movable wall which define a sealed interior space filled with water to cause outward movement of said movable wall upon freezing of said water;

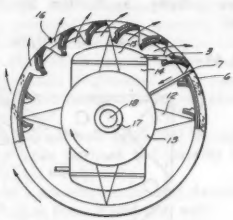
said temperature sensor valve actuator being supported at a peripheral edge of said rigid wall portion with said movable wall adjacent said stem portion of the Schrader-type bleed valve so that with movement of said wall upon freezing of said water said bleed valve is opened to depressurize said control chamber and open said bleed passage to flow of warm fluid into said evaporator.

3,953,985

AIR CONDITION APPARATUS PARTICULARLY FOR AUTOMOTIVE VEHICLES

Rudolf Hintze, Lessingstrasse 32, Heusenstamm, Germany

Continuation-in-part of Ser. No. 307,212, Nov. 16, 1972, Pat. No. 3,852,976. This application May 20, 1974, Ser. No. 469,441
Claims priority, application Germany, Nov. 19, 1971, 2157380
Int. Cl.² F25B *3/00*
U.S. Cl. 62—499 **9 Claims**



1. In an air conditioning apparatus, particularly for automotive vehicles, a combination comprising a rotary compressor device for an evaporable cooling agent; a stationary support for said compressor device; drive means for rotating said compressor device; and a condenser device mounted for rotation with said compressor device and adapted to receive compressed cooling agent, said condenser device comprising an assembly composed of a pair of sheet-material members one of which has a first major surface provided with depressions which form a pair of transversely spaced substantially parallel channels and a plurality of connecting channels extending from one to the other of said parallel channels, the other of said members having a second major surface overlying said

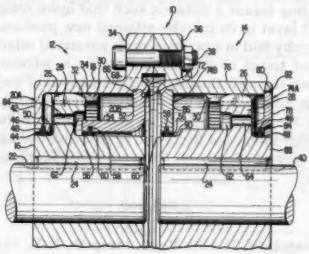
first major surface and being sealingly connected to the same in surface-to-surface contact therewith at strip-shaped portions located between successive ones of said connecting channels and along the periphery of said major surfaces, so as to define with said one member a plurality of fluid-flow passages.

3,953,986

PERMANENTLY SEALED GEAR COUPLING

Michael M. Calistrat, Sykesville, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,876
Int. Cl.² F16D *3/18*
U.S. Cl. 64—9 R **6 Claims**



1. A permanently sealed gear coupling for connecting a pair of substantially coaxially aligned shafts comprising:

a hub means connected to one of said shafts and having radially extending external gear teeth thereon;

a sleeve means connected to the other of said shafts and surrounding said hub means and having radially extending internal gear teeth thereon in meshing engagement with said external gear teeth;

a first annular flange means formed integrally with an outer end of said sleeve means and defining a first annular space with said hub means adjacent on outer side of said external teeth;

a second annular flange means permanently secured to an inner end of said sleeve means and defining a second annular space with said hub means adjacent an inner side of said external teeth; and

a flexible metallic sealing ring member seated in a groove in each of said flange means and closing said annular spaces for retaining lubricant between said flange means and between said hub means and said sleeve means,

said second flange means including a cylindrical portion extending axially towards said inner side of said external teeth for positioning said flexible sealing ring member, seated in said groove therein, near said external teeth.

3,953,987

AIRCRAFT ENGINE FLEXIBLE FLUID DAMPED COUPLING

Richard N. Strasburg, Williamsport, and Ezra F. Critchlow, Addison, both of Pa., assignors to Avco Corporation, Williamsport, Pa.

Filed Jan. 22, 1975, Ser. No. 543,178
Int. Cl.² F16D *3/14*
U.S. Cl. 64—27 R **5 Claims**

1. A flexible mechanical coupling for transmitting power from an engine to a load, comprising, in combination:

a drive member rotatable with the engine,

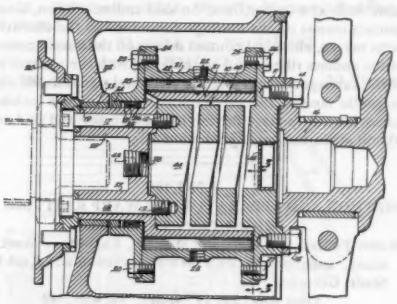
a driven member rotatable with the load,

a generally cylindrical sleeve having a first portion formed with an annular bearing surface and a central normally plugged port and a second portion formed with a set of radially extending teeth,

a helical torsional spring formed with a flanged aft end and an internal bore registering with said port,

means for fastening the driven member and the end of the first sleeve portion and the front end of the spring in rigid relationship,

a generally cylindrical barrel in concentric embrace in relation to said sleeve, said barrel having a set of internal notches in loose complementary engagement to said teeth,



means for fastening said drive member and the flange end of said spring and said barrel in rigid relationship,

damping fluid supplied through said port into said bore and circulating within the chamber provided by said barrel and the flange end of said spring, and

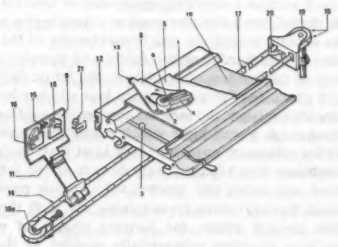
bearing and seal means embracing said annular bearing surface of said sleeve, said barrel including means providing a seat for said bearing and seal means.

3,953,988

HAND KNITTING MACHINE FITTED WITH AN AUTOMATIC NEEDLE SELECTION DEVICE

Alfred Marcel Gloeckler, Mulhouse, France, assignor to Superba S.A., Mulhouse, France

Filed July 16, 1973, Ser. No. 379,305
Claims priority, application France, July 28, 1972, 72.27473
Int. Cl.² D04B *15/66, 7/00*
U.S. Cl. 66—75 A **1 Claim**



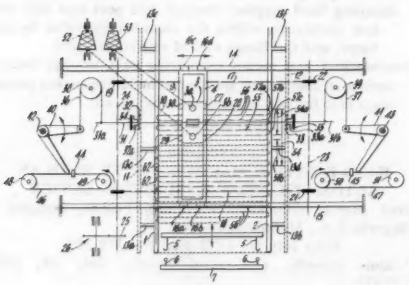
1. In a knitting machine comprising a needle-bed and a needle selecting device; said needle selecting device including a carriage movable in relation to the needle-bed, movable electro-magnetic means fitted on said carriage for movement therewith, a stationary program matrix having a predetermined number of columns and lines and further having electrical means producing an electrical signal according to the presence of studs on said matrix, said movable electro-magnetic means being constructed and arranged to select a needle of said needle-bed in accordance with an electrical signal received from said stationary program matrix, an assembly of

fixed and movable cams constructed and arranged to drive said selected needle in order to achieve various types of knitting, wherein the improvement comprises an electro-mechanical interconnecting means constructed and arranged to electrically and mechanically interconnect said stationary program matrix and said movable electro-magnetic means; said electro-mechanical interconnecting means including a metallic electrically conductive endless ribbon tensioned between two rollers over the width of the needle-bed, one of said rollers being electrically and mechanically connected to said program matrix, a cursor fitted on said endless ribbon, electrical contact means on the carriage connected to the electro-magnetic means, electrical contact means on the cursor connected to the endless ribbon and cooperating with the contact means of the carriage for carrying the electrical signal to the electromagnetic means, and mechanical locking means locking the cursor on the carriage for driving said cursor and said endless ribbon when the carriage is travelling.

3,953,989
METHOD AND APPARATUS FOR WARP KNITTING AND RESULTANT PRODUCT

Walter Politze, and Wolfgang Wunsch, Karl-Marx-Stadt, Germany, assignors to VEB Wirkmaschinenbau, Karl-Marx-Stadt, Germany

Filed Aug. 21, 1974, Ser. No. 499,348
Int. Cl.² D04B *23/06, 23/08, 23/10, 23/12*
U.S. Cl. 66—84 A **11 Claims**

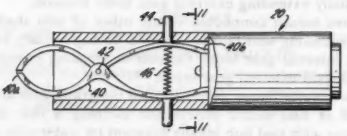


1. A method for the production of a warp knit fabric comprising an array of weft threads in the form of repeating sections, each section comprising a plurality of discrete portions of weft thread, each discrete portion extending in a continuous line at least twice from one lateral border of the fabric to the other lateral border of the fabric and forming a U at at least one of the borders of the fabric, the fabric further comprising a plurality of chains of warp knit stitches holding the weft threads together, the method comprising guiding the weft threads through a weft layer which mutually spaces the weft threads by a distance corresponding to at least twice the distance between two adjacent weft threads of the fabric being produced, advancing two spaced, substantially parallel feeding means having means for retaining the weft threads in a direction toward means for forming chains of warp knit stitches in a direction substantially parallel to the feeding means, reciprocating the weft layer and, therewith, the weft threads from one feeding means to the other substantially transversely to the direction of movement of the feeding means, forming each weft portion by carrying out at least once the cycle of moving the weft layer substantially transversely to the direction of movement of the feeding means from a position in proximity to one of the feeding means toward the other feeding means while the weft layer is operatively connected to said feeding means so that the weft layer moves with said feeding means, when the weft layer reaches said other feeding means operatively disconnecting the weft layer from the feeding means and thereby permitting the feeding means to overtake the weft layer by a distance corresponding to the distance between two adjacent weft threads of the fabric being produced, again operatively connecting the weft layer to the feeding means, moving the weft layer substantially transversely to the direction of movement of the feeding means toward said one feeding means, when the weft layer reaches said one feeding means operatively disconnecting the weft layer from the feeding means and thereby permitting the feeding means to overtake the weft layer by a distance corresponding to the distance between two adjacent weft threads of the fabric being produced, whereby upon each reversal of the direction of the motion of the weft layer the weft threads are formed into U-shaped configurations, continuing the formation of these configurations until the spaces between the individual weft threads are filled whereby a weft section is formed, displacing the weft layer opposite to the direction of motion of the feeding means a distance such that upon reciprocation of the weft layer in its thereby attained new position the weft thread thereby laid in a position most advanced relative to the direction of travel of the feeding means is adjacent to and spaced from the weft thread of the formerly laid weft threads least advanced relative to the direction of travel of the feeding means by the same distance as the distance between two adjacent weft threads of the fabric being produced and repeating the sequence of steps to form adjoining sections.

3,953,990
LOCKING DEVICE

Alice R. Nagel, 68-01 60th Road, Maspeth, N.Y. 11378

Continuation-in-part of Ser. No. 145,158, Dec. 4, 1970, abandoned. This application Mar. 30, 1973, Ser. No. 346,279
Int. Cl.² E05B *73/00*
U.S. Cl. 70—18 **13 Claims**



1. A locking device, comprising chaining means, said chaining means including at least one ring-shaped member, and locking means having key-operated means movable by a key between locked and unlocked positions comprising a pair of tong-shaped members, at least one of which being movable relative to the other, for passing through said ring-shaped member and retaining said ring-shaped member when said key-operated means is in the locked position, a spring for retaining said tong-shaped members in closed position, and tab means on said tong-shaped members for facilitating manual movement of said tong-shaped members against said spring for opening said tong-shaped members, and said key-operated means includes cam means operable to allow said tong-shaped members to be manually opened when the key-operated means is in the unlocked position and to prevent said tong-shaped members from being manually opened when the key-operated means is in the locked position.

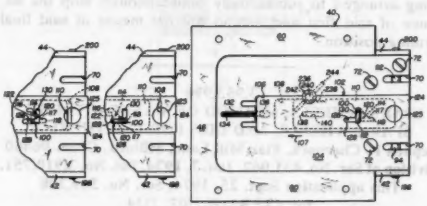
3,953,991
LOCK CONSTRUCTION

Paul M. Grossman, Freehold, N.J., assignor to Albert M. Stein, Scarsdale; Vincent G. Siliato, Brooklyn, both of, N.Y.; Paul Grossman, Freehold, N.J. and Elliot Daskal, Suffern, N.Y.

Filed Aug. 15, 1974, Ser. No. 497,518
Int. Cl.² E05B *47/04, 63/12, 63/20;* **E05C** *1/06*
U.S. Cl. 70—104 **14 Claims**

1. A lock construction for a door or the like comprising a mating piece adapted to be mounted on a door jamb; said mating piece having at least an outwardly extending ear provided with an aperture; and a lock mechanism adapted to be

mounted on a door; said lock mechanism comprising: a lock housing having at least a slot sized and positioned to receive said mating piece ear therein when the door is closed, bolt means movably mounted on the housing for movement between an extended position wherein said bolt means extends through said ear aperture and a retracted position wherein said bolt means and said ear are disengaged, said bolt means comprising an outwardly extending pin movable from a lower position corresponding to the extended position of said bolt means to an upper position corresponding to the retracted position of the bolt means, and spring means for normally biasing said pin to said lower position whereby said bolt means is normally in the extended position; a slide mounted for movement between an extended and a retracted position in said housing, biasing means for biasing siad slide to the extended position, a tapering slot in said slide receiving said pin



therethrough whereby movement of said slide from said extended to said retracted position affects concomitant movement of said pin from said lower to said upper position, a retaining plate mounted for movement in said housing between a retracted and an extended position, said plate having a slot having a transverse portion receiving said pin therein for movement between said lower and upper positions, and a longitudinal portion positioned to be aligned with said pin when said pin is in said upper position, a spring normally biasing said plate to said extended position, whereyb said plate moves to the extended position when said pin is moved to the upper position to receive said pin in said longitudinal portion of said plate slot, striker means on said mating piece for moving said plate to said retracted position to permit movement of said pin to said lower position when said ear is received in said housing slot, and actuating means for moving said slide to said retracted position.

3,953,992

BICYCLE LOCKING DEVICE

Morris Toppel, 5460 N. Spaulding Ave., Chicago, Ill. 60659

Filed June 20, 1974, Ser. No. 481,148
Int. Cl.² E05B *73/00*
U.S. Cl. 70—227 **3 Claims**

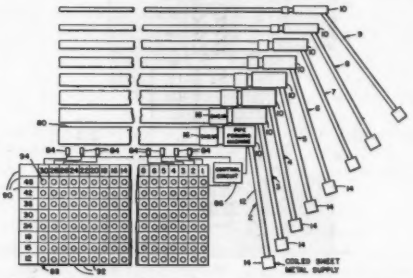
1. A locking device shaped and proportioned to removably engage with a bicycle support;
said locking device comprising a pair of plates;
said plates each having a protuberance extending through said plates;
said protuberance having a portion extending on both sides of each of said plates;
a first and second aligning aperture in each of said plates; and
said plates being in abutment with each other in a locking position whereby said aligning apertures receive a portion of said protuberance in said first aligning aperture and a lock in said second aligning aperture.

3,953,993

MULTIPLE SIZE CULVERT PIPE ROLLING MACHINE

Eugene W. Sivachenko, 6851 Waverly Manner, Redding, Calif. 96001

Filed Oct. 31, 1974, Ser. No. 519,892
Int. Cl.² B21C *37/12*
U.S. Cl. 72—15 **23 Claims**



1. A system for the manufacture of pipe of varying diameters and lengths comprising in combination a plurality of machines for forming pipes of a like plurality of differing diameters, support means receiving each pipe as it is manufactured and for supporting it, means for severing the manufactured pipe to a desired length while the pipe is on the support means, control means operatively coupled with the machines and with the severing means permitting an operator to selectively and independently activate any one of the machines and to activate the corresponding severing means for severing pipe of the desired length, means for discharging the severed pipe from the support means, pipe transport means for receiving the discharged pipe and for passing it to a collection point, and means for stacking pipe as it arrives at the collection point.

3,953,994

CAN BODIES AND METHOD AND APPARATUS FOR MANUFACTURE THEREOF

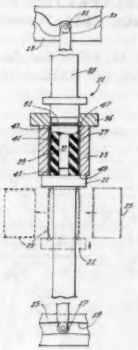
William H. Brawner, Anaheim; Claude A. Gunsalus, Covina, and Lowell K. Rockwell, Walnut, all of Calif., assignors to Dale E. Summer, Tiburon; Lowell K. Rockwell, Walnut; Paul C. Rogers, Whittier; Nick A. Laznibat, Fullerton; Claude A. Gunsalus, Covina; William H. Brawner, Anaheim; Gordon R. Kimmich, Newhall; Leonard J. Plourde, Canoga Park; Marcus W. McGuire, El Cason and George F. Smyth, Los Angeles, all of, Calif., part interest to each

Division of Ser. No. 884,299, Dec. 11, 1969, Pat. No. 3,698,337. This application Apr. 24, 1972, Ser. No. 247,203
Int. Cl.² B21D *51/26*
U.S. Cl. 72—58 **11 Claims**

1. Apparatus for forming a cylindrical can body from a workpiece of substantially circular cross section comprising
a male mandrel
a female die having
a face shaped in accordance with the desired can shape including
flange forming means adjacent at least one axial end thereof for receiving the end of the workpiece upon formation thereof,
neck forming means, adjacent said flange forming means, of a diameter substantially equal to that of

the workpiece to provide a neck on the can being formed which has a diameter which is substantially equal to that of the workpiece, and

an expanded section forming means on the side of said neck forming means opposite said flange forming means and extending toward the distal end of said female die,



means for locating said mandrel within said die adjacent said face,

means for positioning a workpiece within said die between said mandrel and said die face, and

means for exerting a force on said mandrel to cause it to exert a generally radially outwardly directed force over the entire length of the can body to form a flange, neck, and expanded section in the workpiece.

3,953,995

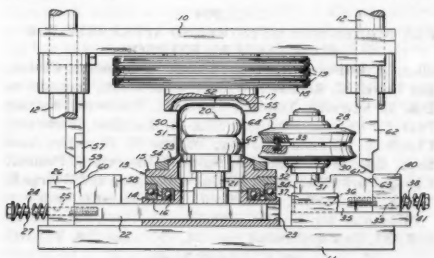
MEANS FOR MAKING DOUBLE GROOVE PULLEYS

John W. Haswell, and Stanley A. Haswell, both of c/o Master Craft Engineering, Inc., 39555 Express Highway, Belleville, Mich. 48111

Filed May 27, 1975, Ser. No. 581,046

Int. Cl.² B21H *1/00*

U.S. Cl. 72—84 **8 Claims**



1. A machine for forming a pulley having a plurality of pulley grooves of given cross section from a pulley blank in the form of a cup, each groove being defined by pulley wall means connected through the root of the groove and each groove being separated from an adjacent groove by a land, comprising axially movable members for engaging said blank adjacent opposed axial ends thereof, means to axially advance at least one of said axially movable members toward the other to a final apposition at which they define a die cavity, first and second rotatably mounted roll die means, said first roll die means being translatable toward the longitudinal axis and the outer sidewall of the cup and having a periphery adapted to roll form the periphery of the blank to a desired configuration, said second roll die means being positioned between said axially movable members, being translatable away from the longitudinal axis and toward the inner sidewall of the cup, and having a periphery adapted to complement the periphery of the first roll die means and to roll form the periphery of the blank to said desired configuration, means to establish relative rotation between said pulley blank and said forming rolls, first roll die moving means to advance said first roll die means from a retracted position toward said longitudinal axis and to a final forming position at which it defines a die cavity corresponding to further portions of a desired configuration, second roll die moving means to advance said second roll die means away from said longitudinal axis toward said first roll die means to said final forming position at which it and said first roll die means together define said further portions of said desired configuration, said first and second roll die moving means being arranged to substantially simultaneously stop the advance of said first and second roll die means at said final forming position.

3,953,996

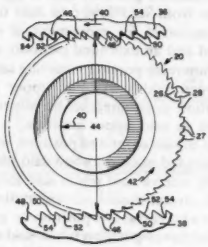
SPARK WHEELS, METHOD OF MANUFACTURING SPARK WHEELS, AND DIES FOR USE THEREIN

Stephen P. Chernock, Flax Mill Lane, Milford, Conn. 06460

Division of Ser. No. 431,062, Jan. 7, 1974, Pat. No. 3,910,751. This application Sept. 25, 1974, Ser. No. 509,298

Int. Cl.² B21H *1/02, 7/14*

U.S. Cl. 72—90 **19 Claims**



1. A process for manufacturing spark wheels having a substantially cylindrical shape, comprising the steps of:

A. forming a plurality of spaced grooves in the outer peripheral cylindrical surface of said spark wheel with land portions there-between, each of said grooves being at an acute angle to the sides of said wheel; and

B. rolling the grooved spark wheel between at least two dies having spark wheel-forming teeth extending transversely to said grooves for forming throughout the peripheral cylindrical surface of the sparkwheel a plurality of raised teeth having sharp cutting edges and burrs.

3,953,997

CUTTING TOOL FACES

Dennis Harry Wale, Woodhouse Eaves, England, assignor to Marwin Cutting Tools Limited, Rothley, England

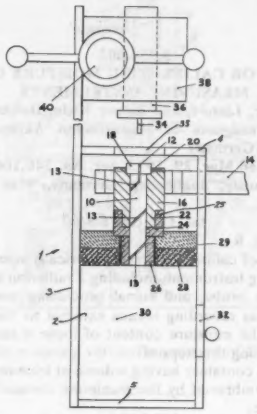
Continuation of Ser. No. 342,073, March 16, 1973, abandoned, which is a continuation of Ser. No. 863,841, Oct. 6, 1969, abandoned. This application Dec. 13, 1974, Ser. No. 532,393

Int. Cl.² B21D *11/06*

U.S. Cl. 72—128 **5 Claims**

1. A method of shaping a helical face piece of hard cutting material for an engineer's tool which comprises providing a discrete piece of hard cutting material to be shaped, being free at its ends, providing a former, providing a source of heat adjacent the former capable of providing a temperature at

which the piece is deformable, subjecting the piece for indirect elevation to said deformable temperature, then introducing the heated piece to the former which enclosingly accepts the same, and then forcing the piece through the former.



3,953,998

MULTI-STAGE WIRE DRAWING MACHINE

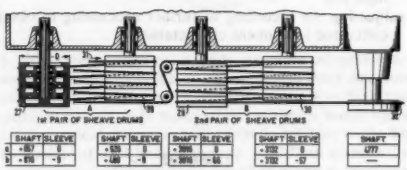
Egon Braun, Haag near Schwabach, Germany, assignor to Maschinenfabrik, Niehoff KG, Schwabach, Germany

Filed July 31, 1974, Ser. No. 493,279

Claims priority, application Germany, Aug. 6, 1973, 2339691

Int. Cl.[2] B21C 1/12

U.S. Cl. 72—289 18 Claims



1. The method of drawing wire on a wire drawing machine having a drum with a driving shaft, a sleeve surrounding said shaft, a plurality of sheaves sequentially disposed and rotatable about said sleeve over which sheaves said wire sequentially passes, comprising the steps of initially interconnecting each sheave in the direction of passage of the wire so as to conjointly rotate at a differential peripheral speed greater than the peripheral speed of the preceding sheave by an amount corresponding substantially to the partial extension of the wire occurring therebetween, initially rotating said sheaves at a lower speed ratio, sequentially passing the wire onto the periphery of each of the sheaves and thereafter simultaneously raising the speed of rotation of all of said sheaves in a ratio corresponding to the progressive extension of said wire occurring between each pair of adjacent sheaves.

3,953,999

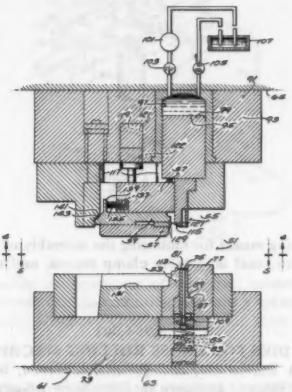
METHOD AND APPARATUS FOR FORMING A SAW CHAIN CUTTER LINK

Douglas A. Northey, and Stanton W. Weber, both of Peterborough, Canada, assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed May 6, 1974, Ser. No. 467,224

Int. Cl.[2] B21D 5/01, 22/00

U.S. Cl. 72—381 11 Claims



11. A method of forming a saw chain cutting link blank including a link portion, a shank portion extending from the link portion, and a toe portion extending from the shank portion into a saw chain cutting link wherein the toe portion extends from the shank portion in angular relation thereto and in transverse relation to the link portion, said method comprising the steps of placing the blank in a die including a first section having a stationary die part and a second section which is reciprocable relative to the first section and which includes a fixed part and first and second die parts movable with the fixed part and relative to the fixed part, partially forming the toe portion relative to the shank portion in response to movement of the first die part in one direction relative to the stationary die part, completing forming of the toe portion into the angular relation to the shank portion and into the transverse relation to the link portion in response to movement of the second movable die part in a direction transverse to the one direction and relative to the stationary die part in response to movement of the first die part relative to the fixed part, and removing the formed link from the die.

3,954,000

BENDING TOOL FOR SEMI-RIGID COAXIAL CABLE

Orel Billy Foust, Richardson, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 29, 1975, Ser. No. 600,017

Int. Cl.[2] B21D 11/00

U.S. Cl. 72—457 8 Claims

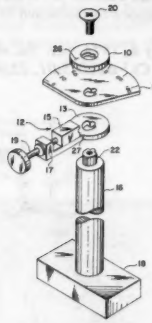
1. A cable and pipe bending tool comprising:

mandrel means with a grooved outer circumference for bending semi-rigid cable and pipe along the track of said grooved circumference;

adjustable clamp means positioned adjacent to one portion of said outer grooved circumference, said clamp means combining with said portion of adjacent grooved circumference to form a cable and pipe holding vice;

compass means with markings thereon for determining bend angles, said compass means being installed adjacent said mandrel means and positioned so that when a cable or pipe gripped by said vice and bent around said mandrel

means the bend-angle may be determined from said markings; and



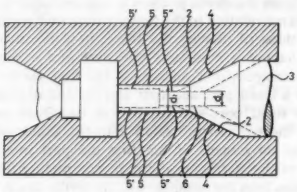
mounting means for mounting the assembly of said mandrel means, said adjustable clamp means, and said compass means.

3,954,001

DIES FOR CROSS ROLLING MACHINES

Hidehiko Tsukamoto, and Nobutaka Maeda, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1974, Ser. No. 511,262
Claims priority, application Japan, Oct. 8, 1973, 48-112262
Int. Cl.² B21H *1/18*
U.S. Cl. 72—469 **1 Claim**



1. Dies for cross rolling machines for manufacturing from round bar stock an axially symmetrical shaft having a reduced central section comprising a shaping side on one side of said dies, said shaping side being configured for rolling engagement with said bar stock to form said axially symmetrical shaft, said dies being movable in a given linear direction to effect said rolling engagement in the formation of said shaft, said shaping side having formed thereon shaping surfaces defining said shaping side as including a threading section, a finishing section and a developing section located intermediate said threading and finishing sections taken relative to said linear direction of movement of said dies, said threading section comprising shaping surfaces for commencing engagement of said bar stock with said dies to initiate formation of said shaft, said developing section being configured to include a reduction shaping surface for effecting reduction of the diameter of said bar stock and lateral extension shaping surfaces for effecting lateral extension of the material of said bar stock, said developing section being formed with said reduction shaping surface and said lateral extension shaping surfaces arranged to effect said reduction and lateral extension simultaneously while said bar stock is in rolling contact with said developing section, said reduction shaping surface being formed throughout its length with a continuous taper taken relative to said linear direction of movement of said dies to enable said developing section to gradually reduce the central diameter of said bar stock while also effecting lateral extension thereof.

3,954,002

METHOD FOR CALIBRATING MOISTURE CONTENT MEASURING INSTRUMENTS

Frank Grieser, Lintorf, and Rainer Klein, Duisburg, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Mar. 29, 1973, Ser. No. 346,106
Claims priority, application Germany, Mar. 30, 1972, 2216379
Int. Cl.² G01T *3/00*
U.S. Cl. 73—1 R **4 Claims**

1. Method of calibrating a radiometrically operating moisture measuring instrument, including a radiation source and a detector in a probe, and signal processing and indicating means, such as recording means external to the probe, for determining the moisture content of loose material such as coke, comprising the steps of:

providing a container having volume at least as large as the volume embraced by the maximum measuring range of the probe;

filling the container with loose material and moisturizing the material in the container beyond saturation, but allowing the material to drain until moisture saturation has stabilized;

taking a radiometric reading of the probe as detecting the moisture content of the material in the container at saturation;

emptying the container and spreading its content to provide a layer of small thickness and permitting uniform evaporation of moisture;

refilling the container and taking a second radiometric reading after having taken at least one sample for gravimetrically determining the moisture content;

repeating the spreading, refilling and instrument reading as well as sample taking and gravimetric determination of the moisture content of the sample, until the material is substantially dry;

providing an associative recording of the gravimetric moisture content determinations and of the instrument readings; and

subjecting the recording to further processing to obtain a calibrated instrument characteristics.

3,954,003

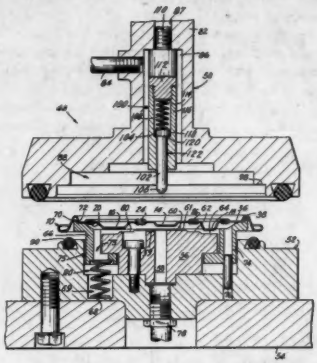
APPARATUS FOR TESTING END CLOSURES

Walter James Dobbins, Hawthorn Woods, Ill., assignor to American Can Company, Greenwich, Conn.

Filed June 20, 1975, Ser. No. 588,712
Int. Cl.² G01M *3/04*
U.S. Cl. 73—40 **4 Claims**

1. An improved apparatus for testing an end closure for leakage, of the type which includes a test chamber formed by a vertically reciprocable upper chambered member and a fixed lower chambered member, and which is sealedly divisible into first and second sections by an end closure placed therein, seating means on the lower chambered member for seating the end closure in registered position thereon and within the lower chambered member, means for injecting high pressure gas into the first section, and sensing means for detecting pressure increase in the second section due to leakage through the end closure, the improvement in the upper chambered member comprising movement preventing means for

contacting the end closure to prevent premature movement and loss of registration of the end closure from its registered



seated position during vertical movement of the upper chambered member.

3,954,004

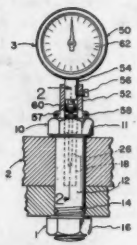
SELF-CONTAINED STRESS INDICATOR MECHANISM

Harry Orner, 2479 Glen Canyon Road, Altadena, Calif. 91001

Continuation-in-part of Ser. No. 141,260, May 7, 1971. This application Jan. 23, 1975, Ser. No. 543,642

Int. Cl.² G01L 5/00

U.S. Cl. 73—88 F 14 Claims



1. In a stress indicator, a body structure adaptable to be stressed by a load, a confined cavity in said body structure, a fluid material completely filling said cavity, a surface means responsive to said fluid material to indicate a linear value of the volumetrical change in said cavity in relation to the linear deformation of said body structure, said fluid material is an elastomatic material under an initial pressure to conform to said cavity, a passage in a wall of said cavity for said surface means biased inward to said cavity by the resilience of said elastomatic material.

3,954,005

PROOF LOADING APPARATUS FOR TESTING ROD-LIKE ARTICLES

Hugh Jeremy Willis Edwards, Guiseley, England, assignor to CCL Systems Limited, Surbiton, England

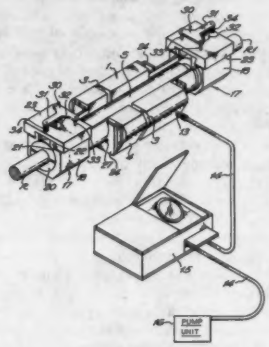
Filed Mar. 10, 1975, Ser. No. 556,944

Claims priority, application United Kingdom, Mar. 20, 1974, 12346/74

Int. Cl.² G01L 5/08

U.S. Cl. 73—103 11 Claims

1. Proof loading apparatus for the non-destructive testing of rod-like articles, said apparatus being of lesser length than articles for which it is particularly adapted to test and comprising a jack housing, at least one hydraulic ram arranged in said jack housing, first and second gripping devices arranged at opposite ends of said jack housing said gripping devices being



axially movable, on operation of said ram, relative to one another, wherein said jack housing and said gripping devices are of generally C-shaped cross-section along their length.

3,954,006

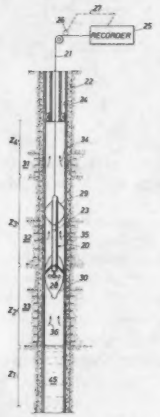
METHODS FOR DETERMINING VELOCITIES AND FLOW RATES OF FLUIDS FLOWING IN WELL BORE

Ronald A. Anderson, and James J. Smolen, both of Houston, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Jan. 31, 1975, Ser. No. 545,859

Int. Cl.² E21B 47/10

U.S. Cl. 73—155 33 Claims



1. A method for determining the velocity of a fluid flowing in a selected interval of a well bore with a flowmeter having sensing means adapted to provide output measurements proportional to the relative velocity of fluids flowing across said flowmeter and comprising the steps of:

passing said flowmeter at a selected travel speed between said selected well bore interval and another interval of said well bore containing a fluid having a known velocity and in a direction of travel counter to said flowing fluid for obtaining one set of output measurements representative of the relative velocities between said flowmeter and said fluids in said selected well bore interval and in said

other well bore interval respectively acting in one relative direction;

passing said flowmeter in the opposite direction of travel between said selected well bore interval and said other well bore interval and only at a selected travel speed which is greater than the velocity of said flowing fluid for obtaining another set of output measurements representative of the relative velocities between said flowmeter and said fluids in said selected well bore interval and in said other well bore interval respectively acting in the other relative direction;

equating at least some of said output measurements in each of said sets respectively obtained in said other well bore interval for correlating those of said output measurements in each of said sets respectively obtained in said selected well bore interval; and

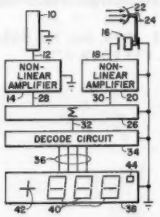
determining the differential between at least one output measurement from said one set obtained at a selected depth location within said selected well bore interval and at least one output measurement from said other set obtained at said selected depth location for deriving a function representative of the axial velocity of said flowing fluid in said selected well bore interval.

3,954,007

WIND CHILL INSTRUMENT

Roy M. Harrigan, Bromley Mountain Road, Manchester, Vt. 05254

Filed May 2, 1975, Ser. No. 573,857
Int. Cl.² G01W *1/17*
U.S. Cl. 73—170 R **5 Claims**



1. A wind chill instrument which comprises:

a. temperature responsive means producing an indication of temperature;

b. wind velocity responsive means, and

c. means operatively coupling said wind velocity responsive means and said temperature responsive means for altering the indication of temperature of said temperature responsive means based on wind velocity.

3,954,008

ULTRASONIC FLOW OR CURRENT METER

Miaki Yamamoto; Hidekazu Asada, both of Tokyo, and Masaharu Maki, Hachioji, all of Japan, assignors to Kabushikikaisha Tokyo Keiki, Tokyo, Japan

Filed June 20, 1974, Ser. No. 481,175
Claims priority, application Japan, June 23, 1973, 48-70983
Int. Cl.² G01F *1/66*
U.S. Cl. 73—194 A **1 Claim**

1. An ultrasonic flow or current meter comprising

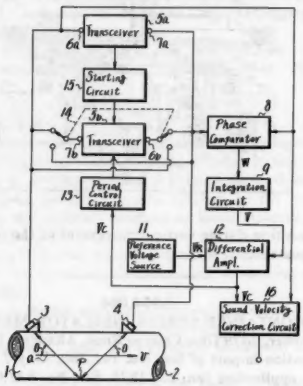
a pair of ultrasonic vibrators mounted on a pipe through which liquid to be measured flows;

a first ultrasonic sing-around system connected to said pair of ultrasonic vibrators which propagates a train of ultrasonic pulses through said liquid in one direction with respect to flow direction of said liquid;

a second ultrasonic sing-around system including a variable time delay circuit connected to said pair of ultrasonic vibrators which propogates a train of ultrasonic pulses through said liquid in the direction opposite to that of said first-mentioned ultrasonic pulses of said first ultrasonic sing-around system;

phase detecting means for detecting the phase difference between said ultrasonic pulses in said first and second systems and producing a detected output signal in response to said phase difference;

a control means connected to said second ultrasonic sing-around system to control the variable time delay circuit



and said ultrasonic pulses in said second system so that the sing-around periods of said first and second sing-around systems are substantially the same at all times based on the detected output signal from said detecting means;

a converting means receiving the output of said phase detecting means and supplying an output to said control means; and

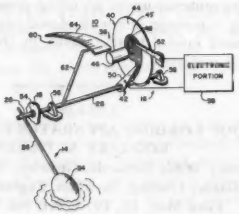
a flow velocity means connected to the output of said converting means and for producing an indication of the flow velocity of said liquid.

3,954,009

FLOW METER

Louis Franklin Lederer, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Oct. 4, 1972, Ser. No. 295,012
Int. Cl.² G01N *1/10*; G01F *1/04*
U.S. Cl. 73—198 **4 Claims**



1. Apparatus for measuring the rate of flow of a fluid through a channel, comprising:

means for generating a signal proportional to the height of the fluid flowing through the channel;

rotatable means;

said rotatable means including information stored in a form that can be sensed;

means for sensing said information;

means for positioning said means for sensing said information and said rotatable means with respect to each other in accordance with the signal from the means for generating a signal proportional to the height of the fluid flowing through the channel;

said means for sensing including means for generating a plurality of pulses proportional in number to the rate of flow of fluid through said channel from said information;

said information on said rotatable means including indicia indicating a flow rate for at least certain heights of said fluid in said channel whereby the rate of flow through the channel is corrected for non-linear distortion; and

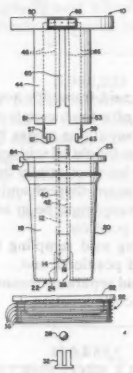
means for counting said pulses, whereby a signal is provided indicating the amount of fluid flowing past said means for measuring the height of the fluid in a fixed period of time.

3,954,010

VISUAL AND ELECTRONIC BATTERY HYDROMETER

Richard W. Hilblom, Tinley Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 25, 1975, Ser. No. 571,896
Int. Cl.² G01N 9/18; G01F 23/02
U.S. Cl. 73—291 **4 Claims**



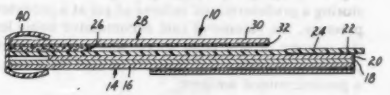
1. A combined direct visual and remote liquid condition indicating device comprising a container means having an open end, a closed end which is insertable into the liquid to be monitored and a channel which extends towards said open end of said container means from said closed end; a float retained in said channel, an inner member having an exterior shape that is configurated so as to generally conform to the interior shape of said container means, a light source and a light detector secured to said inner member on opposite sides of said channel in alignment with each other so that said float acts as a shutter therebetween in accordance with the level and specific gravity of the liquid that is being monitored, said light source and said light detector being positioned adjacent said closed end of said container means, an elongated light transmitting direct viewing rod secured to said container means and having a conical shaped end portion which extends into said channel for providing a visual liquid condition indication adjacent said open end of said container means, terminal means on said inner member adjacent said open end of said container means, electrical lead wires extending from said light source and from said light detector to said terminal means and sealing means for sealing said container means and said inner member so as to prevent liquid from reaching said light source and said light detector.

3,954,011

SELECTED TIME INTERVAL INDICATING DEVICE

Wendell J. Manske, Birchwood, Wash., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 400,044, Sept. 24, 1973, abandoned. This application Oct. 10, 1973, Ser. No. 404,891
Int. Cl.² G01K 11/16, 11/06
U.S. Cl. 73—356 **14 Claims**



1. An indicating device for indicating a selected time interval comprising, in combination, a plurality of porous fluid source pads each carrying a preselected liquid saturant material having differing melting points, a branched wick, each of said branches capable of wicking liquid saturant in liquid form from the associated porous fluid source pad the branches of said wick terminating at a common point, means for selectively regulating migration of the rate of the liquid from said fluid source pads to said wick below the migration rate provided by a free pool of the liquid, said combination including means for indicating the presence of fluid saturant at the common terminus of said wick.

13. A device for indicating the passage of a selected time interval comprising, in combination,

a. a channel shaped carrier comprising a base having a pair of upwardly extending side walls disposed along opposite side edges of said base, each side wall having an undulating shape defining two inwardly opening upper and lower grooves extending substantially parallel to said base and separated from one another by an inwardly extending central portion,

b. a wick of a preselected shape seated on said base between said side walls,

c. a fluid carrying porous pad having a thickness less than the distance between said upper and lower grooves, said pad being capable of containing and selectively presenting a controlled amount of fluid to said wick and containing means for selectively limiting the maximum migration rate for a given fluid below the migration rate provided by a free pool of the fluid, and

d. an upper cover means received between the upper grooves of said carrier side walls in spaced relation to said base and said liquid carrying porous pad attached in underlying relation thereto, said cover means being movable from said upper to said lower grooves to bring said pad into contact with said wick whereby said wick is partially juxtaposed with said pad.

3,954,012

AUTOMATIC SAMPLER APPARATUS

Urs Christen; Raymond Ernest Pecsar, both of Walnut Creek, and Brent E. Wadsworth, Concord, all of Calif., assignors to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 337,800, March 5, 1973, abandoned. This application June 3, 1974, Ser. No. 475,481
Int. Cl.² G01N 1/12
U.S. Cl. 73—422 GC **12 Claims**

1. An automatic injection apparatus comprising a side arm syringe and means for purging said syringe with a liquid, said syringe purging means comprising:

a. a closed container for holding said liquid, said container in operation having a head space above said liquid;

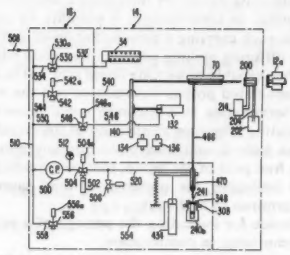
b. a first conduit extending in operation into said container and defining a first port opening into said liquid, said first

conduit communicating through a side port of said syringe with a fluid receiver;

c. means for preventing communication between said first conduit and said fluid receiver;

d. a second conduit extending in operation into said container and defining a second port opening into said head space;

e. means for providing a controlled quantity of purging liquid through said syringe, said controlled quantity of purging liquid being adequate to purge said syringe irrespective of the head space volume and the viscosity of said liquid, said means for providing said controlled quantity of purging liquid comprising an accumulator for storing a predetermined volume of gas at a predetermined pressure, the volume of said accumulator being less than the volume of said head space, and said predetermined pressure exceeding the pressure at said fluid receiver by a predetermined amount;



f. means for providing a gas supply to said accumulator;

g. means for providing communication from said accumulator to said second conduit; and

h. first and second valves, said first valve being selectively operable and having a first state for providing communication from said gas supply means to said accumulator for charging said accumulator, and a second state for providing communication from said accumulator to said second conduit, said second valve being connected to said second conduit and said first valve, said second valve having a first state for providing communication from said container to atmospheric pressure via said second conduit and a second state for permitting communication from said first valve to said second conduit, whereby in said second state of both said first and second valves said gas discharges from said accumulator into said head space.

3,954,013

VARIABLE OPENING DEVICE

Clinton L. West, Yuba City, Calif., assignor to Yuba City Steel Products Co., Yuba City, Calif.

Filed July 23, 1975, Ser. No. 598,209

Int. Cl.[2] G01N 1/08

U.S. Cl. 73—423 R **12 Claims**

1. A variable diameter toroidal device comprising:

a. a resilient tube of predetermined length, inside diameter and outside diameter,

said tube being curved in a circle with the ends located in close juxtaposition so that said tube forms a toroid of predetermined diameter;

b. an uninterrupted helix of substantially non-resilient material embedded in said tube in coaxial relation, said helix being effective to resist forces exerted on said tube tending to change said predetermined inside and outside diameters of said tube and ineffective to resist forces exerted on said tube tending to change said predetermined length of said tube and said predetermined diameter of said toroid;

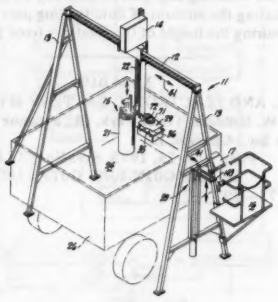
c. means communicating with fluid inside said tube for selectively establishing the pressure of said fluid, said predetermined diameter of said toroid being dependent upon the forces exerted on said tube by said fluid pressure.

7. An apparatus for sampling a crop from a load of given height, said apparatus comprising;

a. a frame including a rail located above said load;

b. a hoist column suspended from said rail;

c. a sampling tube translatably mounted on said hoist column for vertical movement between an upper first position above said load and a second lower position wherein the lower end of said sampling tube is adjacent the bottom of said load;



d. separator means on said frame for accepting only a predetermined portion of a load sample released from said sampling tube, said separator means being adjustable in dependence upon the height of said load and being movable between a first location axially below said sampling tube in said first position thereof and a second location removed from said sampling tube in any position thereof other than said first position;

e. means for translating said sampling tube between said first end said second positions; and,

f. means for moving said separator means between said first location and said second location.

3,954,014

MULTIPLE SHOT PIPETTER

John H. P. Andrews, Jr., Baltimore; Stephen J. Ehrlich, Randallstown, and Rudolfo R. Rodriguez, Columbia, all of Md., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Dec. 16, 1974, Ser. No. 532,779

Int. Cl.[2] G01N 1/14

U.S. Cl. 73—425.6 **3 Claims**

1. A device for aspirating a supply of liquid into a pipette and dispensing the same in precise predetermined dosages, said device comprising:

a housing; a cylindrical passage within said housing, said passage having an open front end and an open rear end;

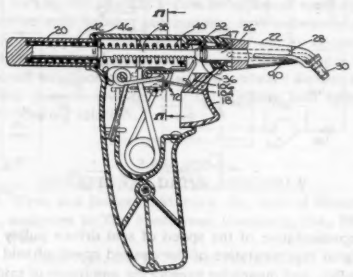
a piston extending into said passage from said rear end;

a plunger extending rearwardly from said piston; means on said housing for securing a pipette to said housing in communication with said passage front end;

a trigger extending from said housing;

actuating means disposed within said housing for advancing said plunger forward a discrete amount each time said trigger is pressed and released, said actuating means including a ratchet mounted to said plunger; first and second pawls disposed within said housing, said first pawl being normally disengaged from said ratchet and brought into engagement with said ratchet when said trigger is pressed, said second pawl is movable between a first

position engaging said ratchet and a second position not in engagement with said ratchet; and said disengaging means includes a cam in engagement with said second pawl and shiftable between a first position wherein said



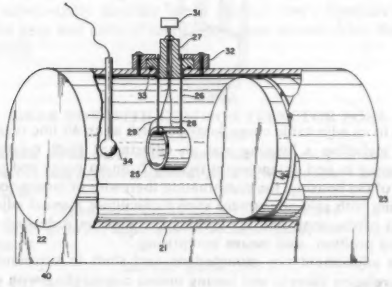
second pawl is maintained in its first position and a second position wherein said second pawl is permitted to assume its second position; and,

means for disengaging said actuating means whereby said plunger may freely be moved back and forth.

3,954,015
METHOD OF DETERMINING PIEZOELECTRIC CONSTANTS OF CERAMIC RINGS

Joseph F. Zalesak, Alexandria, and Peter H. Rogers, Reston, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 17, 1975, Ser. No. 596,871
Int. Cl.² G01M 7/00
U.S. Cl. 73—552 **2 Claims**



1. The method of determining piezoelectric constants of cylindrical piezoceramic rings which comprises:

measuring the electrical capacitance of the rings;

measuring the omnidirectional sensitivity at a low frequency;

measuring the ratio of the axial and radial sensitivity of the ring at a higher frequency than said low frequency;

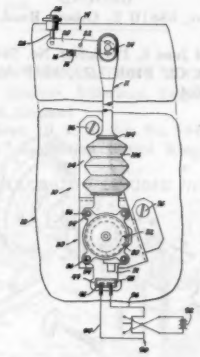
measuring the thickness, height and median radius of said ring, and

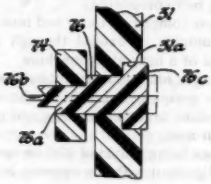
inserting the above determined values into a known formula by which said piezoelectric constants are determined.

3,954,016
DOOR LOCK ACTUATOR

Edmund F. Sarosy, Birmingham, and Bert R. Wanlass, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1974, Ser. No. 527,690
Int. Cl.² F16H 19/04
U.S. Cl. 74—29 **4 Claims**





1. A linear actuator comprising a housing having a longitudinal cavity therein with an opening at one end thereof; an output member disposed in the cavity for longitudinal movement therewithin between first and second positions including a rod portion having a longitudinal axis and extending outwardly through the opening and adapted to be connected to a member to be actuated; a longitudinal slot in said output member, a rack of gear teeth formed on an inner longitudinal surface defining the slot of the output member; reversible motor means connected to the housing and having an output shaft; a pinion connected to said output shaft and having teeth meshing with the gear teeth of said rack and the axis of rotation of said pinion being perpendicular to and intersecting said longitudinal axis of said rod portion, said motor means and pinion being operative to drive the rack and output member between said first and second positions; single roller means engaging an outer longitudinal surface of the output member opposite said rack and said pinion engagement for maintaining said engagement and for guidably supporting the output member during said movement between said positions; support means mounting said roller means including a post extending through one wall of said housing, an eccentric portion on said post rotatably supporting said roller means, adjustment means on said post for permitting rotation of said post relative to said housing so that said eccentric portion enforces proper meshing of said rack and pinion, and a deformable portion on said post being deformed to secure said post in said housing to prevent rotation of said post after proper meshing is accom-

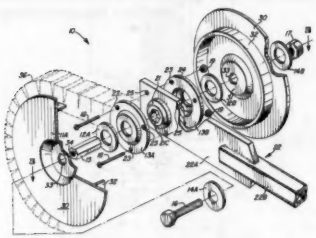
plished; and manual means operatively connected to said output member for manually moving said output member between said first and second positions independently of said motor means.

3,954,017

WHEEL ASSEMBLY FOR SUPPORTING AN ENDLESS RESILIENT BELT FOR PICKING COTTON OFF THE GROUND

Earl E. Musgrove, 6861D E. Osborn Road, Scottsdale, Ariz. 85251

Filed June 6, 1975, Ser. No. 584,647
Int. Cl.² F16H 7/22; A01D 46/14
U.S. Cl. 74—230.4 6 Claims



1. A wheel assembly for supporting an endless ground lying, cotton picking belt comprising:

bearing means comprising outer and inner coaxially aligned races mountable to extend through an opening in an appendage of a harvesting machine,

a pair of flanges one mounted on each side of the bearing means for grasping and holding the outer race of said bearing means to the appendage and providing openings along their axes,

said inner race being provided with an opening along its axis in axial alignment with the opening in said flanges,

a pair of wheel sections,

each of said sections comprising an opening along its axis for receiving a shaft coupler,

a shaft coupler extending through and interlocking with the opening in one of said sections, the opening in one of said flanges, said opening of said inner race and said opening in said other wheel section, and

bolt and nut means extending through said shaft coupler from one side of a first wheel section to the opposite side of the other wheel section for holding said wheel assembly together,

each of said wheel sections being provided with an axially aligned circular flange extending inwardly of the wheel assembly toward the other wheel section for supporting the edges of a belt extending at least partially around the wheel assembly.

3,954,018

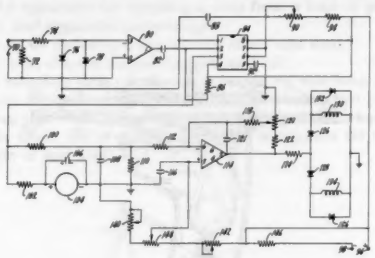
PULLEY DRIVE CONTROL SYSTEM

Gerald N. O'Berto, Wheaton, Ill., assignor to Lovejoy, Inc., Downers Grove, Ill.

Filed Nov. 8, 1974, Ser. No. 521,965
Int. Cl.² F16H 58/52
U.S. Cl. 74—230.17 A 6 Claims

1. A pulley drive control system including a driven pulley, a driving pulley, belt means connecting said pulleys, said driving pulley having spaced discs, means for varying the spacing between said discs to vary the speed of said belt means,

speed sensing means adjacent said driven pulley for providing an electrical signal representative of the speed of said driven pulley, and regulating circuit means connected to said sensing means for using said speed signal to provide an adjustment signal to operate said means for varying the disc spacing, said regulating circuit means including comparison circuit means for comparing the electrical signal



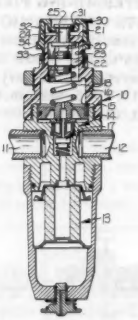
representative of the speed of said driven pulley with a signal representative of the desired speed of said driven pulley, and means for varying the amplitude of said signal representative of the desired speed of said driven pulley.

3,954,019

ADJUSTMENT AND LOCKING MECHANISM FOR ADJUSTABLE CONTROL DEVICE

George R. Ferguson, Rte. 2, Clover, S.C. 29407

Filed June 3, 1974, Ser. No. 475,833
Int. Cl.² G05G 1/04
U.S. Cl. 74—527 10 Claims



1. In an adjustable control device, such as an air line regulator, including a housing and an adjustment shaft rotatably mounted in and extending outwardly from an outer end portion of the housing, the combination therewith of means cooperating with said adjustment shaft to facilitate manual adjustment of the shaft and for locking the same in a desired adjusted position, said means comprising;

an adjustment cap mounted on said shaft in surrounding relation thereto and having means cooperating with said shaft for permitting effecting rotational movement of said shaft upon rotation being imparted to said cap,

said cap being mounted on said shaft for axial movement therealong between a first axial position permitting rotational adjustment of said shaft and a second axial position locking the shaft against undesired rotational movement,

said cap having a collar portion surrounding said outer end portion of said housing and said shaft and having a plurality of splines facing radially inwardly from the inner surface of said collar portion and extending along the collar portion generally parallel to the axis of said shaft,

said outer end portion of said housing having a plurality of radially outwardly facing splines thereon adapted for cooperating with the inwardly facing splines on said cap,

said cap when in said first axial position on said shaft so positioning said inwardly facing splines as to be out of interlocking engagement with said outwardly facing splines on said housing for permitting rotational adjustment of said shaft,

said cap when in said second axial position on said shaft positioning said inwardly facing splines in interlocking relation with said outwardly facing splines on said housing for locking the shaft in a desired adjusted position, and

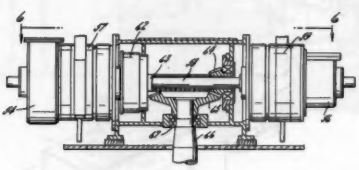
means on said housing surrounding said outwardly facing splines in spaced apart relation therefrom for cooperating with said collar portion of said cap when said cap is in said second axial position for resisting outward flexure of said collar portion and thereby maintaining said splines in interlocking relation.

3,954,020

ROTATIONAL DRIVE ASSEMBLY

John D. West, and James G. Morrow, Sr., both of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Apr. 24, 1975, Ser. No. 571,302
Int. Cl.² F16H *57/00*
U.S. Cl. 74—410 **10 Claims**



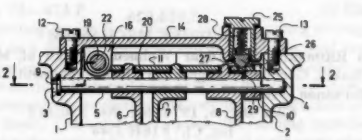
1. A drive mechanism for causing relative movement between first and second parts comprising, in combination, a first gear mounted on said first part, a drive shaft carried on said second part, a drive gear secured to said shaft adjacent the teeth of said first gear, a pair of pinion gears journalled on idler shafts disposed laterally on either side of said drive shaft and meshing with the teeth of said drive gear and said first gear, and means on said second part journalling said drive shaft for rotation and for permitting a limited range of movement of said drive gear toward and away from said first gear to substantially equalize tooth contact force between said drive gear and each of said pinion gears as said drive shaft is rotated.

3,954,021

GEAR BOX WITH COMMON SELECTOR FORK ACTUATOR

Vladimir Mraz, Strakonice, Czechoslovakia, assignor to Ceske zavody motocyklove, narodni podnik, Strakonice, Czechoslovakia

Filed Nov. 29, 1973, Ser. No. 420,144
Claims priority, application Czechoslovakia, Nov. 30, 1972, 8158-72
Int. Cl.² B60K *20/12*
U.S. Cl. 74—473 R **10 Claims**



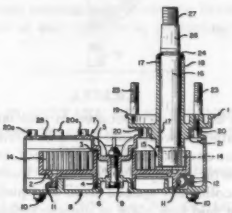
1. In a gear box having a housing in which a plurality of selector forks are mounted to be movable along a common axis and a substantially flat rectangular gate movable in an axis angular to said common axis, said gate having means for engaging and shifting each of said selector forks into predetermined positions on movement thereof, the improvement for mounting said gate comprising an elongated guide rod secured at each end to said housing parallel to the axis of movement, at least one slide bearing having a conforming bore fixed to said gate and located about said guide rod and a rotatable sleeve journalled about the common axis of said selector forks engaging the surface of said gate at a point remote from said guide rod for stabilizing the gate against rotation about the axis of said guide rod.

3,954,022

MOTION TRANSMITTING SYSTEMS

James Frederick Hemens, Billericay, England, assignor to Teleflex Limited, England

Filed Sept. 10, 1974, Ser. No. 504,483
Claims priority, application United Kingdom, Sept. 11, 1973, 42715/73
Int. Cl.² B62D *1/20*; **G05G** *1/08*
U.S. Cl. 74—496 **4 Claims**



1. A motion transmitting unit comprising a housing, a cable wheel mounted within said housing, a shaft with a pinion thereon in driving engagement with said cable wheel, and a onepiece body which serves as a bearing support for said shaft, said shaft having a shroud portion providing a means for mounting said unit to a support surface, which when said unit is orientated with its housing lowermost is spaced below the upper region of said shaft and said bearing support therefor, said bearing support comprising a tubular portion of said body, said shroud portion comprising a web structure extending transversely of said tubular portion, said housing having a pair of upper and lower housing halves, said web structure being integral with said upper housing half so that said onepiece body also includes said upper housing half, said web structure being detachably fitted to said upper housing half, said web structure and said upper housing half having interengaging locating means by which said housing can be set relative to said web structure in any of a plurality of determined angular positions about the axis of said shaft.

3,954,023

AUTOMATIC LOCK AND RELEASE MECHANISM FOR OPENING MOVABLE-SLAT WINDOWS

Guillermo Perez-Aguilar, Pino 343-C, Mexico City 4, D. F. Mexico

Filed Dec. 6, 1974, Ser. No. 530,323
Claims priority, application Mexico, Dec. 11, 1973, 148019
Int. Cl.² G05G *5/06*
U.S. Cl. 74—533 **2 Claims**

1. An improved actuating lever to open or close movable-slat windows or the like with an automatic locking and release device, which includes a crank-like lever with a knob at its end for manipulation, which actuates a link of an articulated mechanism which moves the long bars of the window, which said bars in turn open or close said window, wherein the improved automatic locking and release mechanism comprises a housing including a bottom wall wherein first and second plates are pivotally mounted and are reciprocally

engaged by means of gear teeth, the first of the two plates having two recesses therein one located within the other, said inner recess being deeper; one end of said crank-like lever having a pin which extends outwardly therefrom, said pin being disposed in a hole located in the bottom of the first recess, said lever forming a cover for the said second recess wherein is housed a plate from which there extends two spaced parallel pawls; said housing further including a lateral wall, said plate having a slot in the side opposite said pawls wherein is located a spring which continuously presses the

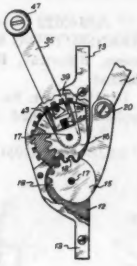


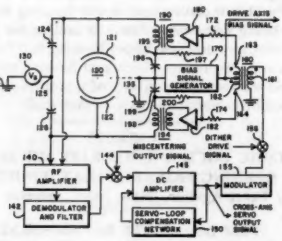
plate against certain slots located in said lateral wall of said housing; located between said pawls in a triangular cam having a hole near one rounded vertex thereof, in said hole a pivot is disposed which projects outwardly from said crank-like lever and is colinearly spaced from said pin, the width of the first recess in said first plate is slightly greater than the width of the crank-like lever; the width of the triangular cam is less than the space separating said two pawls, and the second plate which is actuated by the gear teeth of the first plate forms the end of a link of the articulated mechanism for opening and closing the window.

3,954,024

AUTOMATIC ADAPTIVE CENTERING APPARATUS FOR ELECTRICALLY SUPPORTED INERTIAL INSTRUMENTS

Robert C. Staats, Largo, Fla.,' assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 25, 1974, Ser. No. 518,028
Int. Cl.² G01C *19/30*
U.S. Cl. 74—5.41 **4 Claims**



1. In an inertial instrument wherein an electrically conductive inertial member is supported within a cavity defined by a plurality of pairs of electrically isolated electrodes including a first pair and a second pair, the two electrodes of each said pair being positioned at diametrically opposite locations with respect to said cavity and wherein a plurality of suspension servo channels are provided, including first and second suspension servo channels, for supplying electric charge to said plurality of pairs of electrodes, respectively, to maintain said inertial member suspended between said electrodes substantially at the center of said cavity, means for compensating for errors in the centering of said inertial member comprising:

means for generating a dither signal of a predetermined frequency and superimposing said dither signal upon the electric charge supplied by said first suspension servo channel;

means for detecting at the output of said second suspension servo channel, the presence of an error signal produced by cross-coupling of said dither signal; and

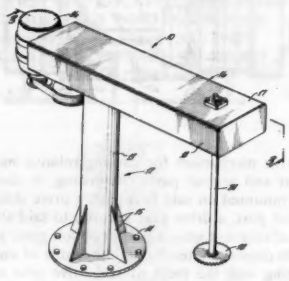
means for receiving said error signal from said second suspension servo channel and providing a feedback to said second suspension servo channel so as to control the electric charge provided by said second suspension servo channel to said second pair of electrodes and thereby recenter said inertial member.

3,954,025

BRIDGE CONSTRUCTION FOR DISPENSING APPARATUS

Donald M. Schnear, Corona del Mar, Calif., assignor to Morehouse Industries, Inc., Fullerton, Calif.

Filed Oct. 16, 1974, Ser. No. 515,295
Int. Cl.² F16H *57/02*
U.S. Cl. 74—611 **2 Claims**



1. Industrial apparatus for mixing and dispersing materials within liquids comprising:

a bridge assembly comprising an elongated hollow member made of a single sheet of metal plate formed so that the member has a generally rectangular cross-section throughout its length with a first horizontal wall supporting a first bearing means, two adjoining side walls perpendicular to said first horizontal wall and two horizontal flanges formed integral with the side walls and extending towards each other to define a partial second horizontal wall with an elongated gap between the flanges,

an impeller shaft rotatably supported by said first and second bearing means and extending downwardly from said bridge member; and

motor means mounted on said bridge member and connected by means extending thru said hollow member to drive said impeller shaft.

3,954,026

WHEEL DRIVE MECHANISM

Udo Rittmann, and Edgar Wahnemuehl, all of Muelheim (Ruhr), Germany, assignors to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 6, 1974, Ser. No. 530,112
Int. Cl.² F16H *3/44*
U.S. Cl. 74—784 **10 Claims**

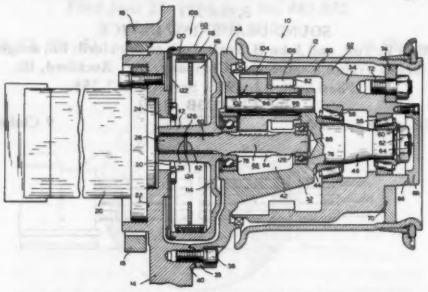
1. In a wheel drive mechanism mounted on a support member having an opening therethrough, the combination comprising:

a. a drive motor mounted on one side of said support member and having an output shaft extending through said support member opening;

b. a reduction gear box housing having a flange portion on one end thereof removably mounted on another side of said support member and having a stationary spindle outwardly extending from another end thereof and coaxial with said drive motor output shaft;

c. a driving shaft rotatably journalled in said gear box housing, axially aligned with said motor output shaft, and having a first portion within said gear box housing and a second portion extending outwardly therefrom toward said drive motor output shaft;

d. friction brake means, including a friction lining, for braking said wheel drive mechanism, arranged in a space-saving manner coaxially around said motor output and drive shafts and interposed between the said another side of said support member and the said one end of said gear



box housing, with a rotatable member of said friction brake means also serving as means for continuously coupling together, for conjoint rotation, said drive shaft second portion and said motor output shaft;

e. a rotary gear case having a first hub portion surrounding and rotatably mounted on said spindle, said first hub portion including means for mounting a wheel thereon, said gear case further including a second hub portion surrounding a substantial portion of said gear box housing, said second hub portion including an internal ring gear;

f. a drive gear on said driving shaft first portion; and

g. gear means rotatably journalled in said gear box housing and in mesh with both said driving shaft drive gear and said rotary gear case internal ring gear, whereby only said gear box housing need be removed from said support member in order to permit direct access to said friction brake means.

3,954,027

SEALING DEVICE FOR A CONTROL LEVER IN A VEHICLE

Tage Ernst Söderberg, Stockholm; Sten-Göran Olofsson, and Nils Hilding Nilsson, both of Nykvarn, all of Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

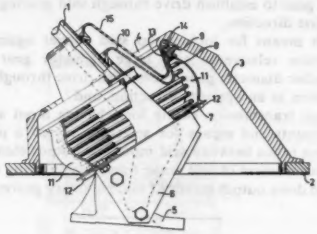
Filed July 5, 1974, Ser. No. 485,996

Claims priority, application Sweden, July 9, 1973, 7309618

Int. Cl.² B60K *20/00*

U.S. Cl. 74—473 P **10 Claims**

1. A sealing device for a control lever extending through an opening in a floor or wall element in a vehicle, said sealing device comprising an opening-covering sealing member of an elastic material which sealingly encloses the control lever in a plane substantially normal to the longitudinal direction of the control lever, characterized in that the sealing member is arranged to be pressed by one end of a coil spring into engagement with an opening-surrounding guide groove in the floor or wall element or in means which are rigidly connected thereto, the second end of said coil spring engaging a support rigidly connected to the device the control lever is intended to influence, said coil spring surrounding the control lever and having so large a diameter so as to permit normal movement of the control lever without the control lever coming into contact with the spring, said coil spring also being designed to provide



a constant contact pressure in the guide groove independent of the length alterations the spring is subjected to under operation and to prevent transmission of motion between said support and the floor or wall element by permitting lateral movements.

3,954,028

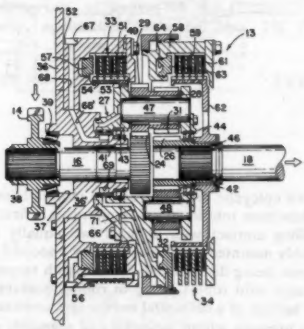
COMPACT PLANETARY DRIVE TRANSMISSION PROVIDING ONE-TO-ONE DRIVE RATIO IN EITHER DIRECTION

Willis E. Windish, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 5, 1973, Ser. No. 412,601

Int. Cl.² F16H *3/44*

U.S. Cl. 74—792 **3 Claims**



1. A transmission including a planetary gearing system providing a reversible one-to-one drive ratio comprising:

a large diameter gear having a first number of gear teeth of a first pitch,

a smaller diameter gear disposed for rotation about the same axis as said large diameter gear and having a like number of gear teeth of finer pitch,

an idler gear engaged with said smaller diameter gear and having gear teeth which are of said finer pitch,

a planetary gear carrier extending adjacent said large diameter gear and said idler gear,

at least one compound pinion planet gear disposed for rotation on said carrier and having a first set of gear teeth engaged with said larger diameter gear and being of similar pitch, said pinion gear having a second smaller diameter set of gear teeth engaged with said idler gear, said first and second sets of gear teeth being equal in number but with said first set having said first pitch and said second set having said finer pitch,

rotary drive input means coupled to one of said large diameter and said smaller diameter gears and rotary drive output means coupled to the other thereof,

brake means for selectively preventing orbital motion of said carrier and said pinion gear around said large diameter gear to establish drive through said gearing system in a first direction,

clutch means for locking up said carrier against orbital motion relative to said large diameter gear and said smaller diameter gear to establish drive through said gear system in an opposite direction, and

a range transmission of the form having input and output elements and means for selecting any of a plurality of drive ratios between said input and output elements, said input element of said range transmission being coupled to said drive output means of said planetary gearing system.

3,954,029

ROLLER TYPE EPICYCLIC DRIVE

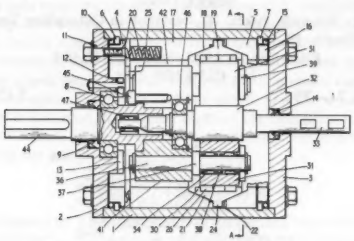
Samuel Robert Wood, 3 Raymond Ave., Warrawee, New South Wales, Australia (2074)

Filed Dec. 17, 1974, Ser. No. 533,509

Claims priority, application Australia, Jan. 4, 1974, 64204/74

Int. Cl.² F16H *13/10*

U.S. Cl. 74—798 **8 Claims**



1. An epicyclic drive to transmit motion between members on a common rotational axis comprising a first shaft member in rolling contact with at least two equally spaced rollers rotatably mounted on pins carried by a second shaft member, said pins being displaceable radially with respect to the common axis, said rollers being in rolling contact also with the inner surface of a helicoidal component contractibly mounted under pressure within a plurality of segments each having at least one surface cooperating with a surface of an adjacent component in an outer member to exert pressure on the helicoidal component and thereby at the surfaces in rolling contact so as to effect tractive engagement between the members.

3,954,030

FULCRUM TYPE CAN OPENER

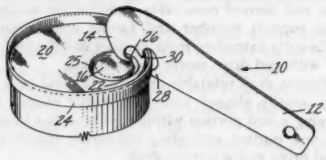
Albert E. Newton, Beverly, Mass., assignor to USM Corporation, Boston, Mass.

Filed Aug. 26, 1975, Ser. No. 607,881

Int. Cl.² B67B *7/00*

U.S. Cl. 81—3.46 R **3 Claims**

1. A can opener of the manually pivotal type comprising a flat lever having a handle portion and a rounded cam shaped extremity, said extemity being adapted to bear progressively inwardly radially on a closure of a can end to be opened, the lever having intermediate the handle portion and the cam extremity a pair of fulcrum portions one of which is disposed to bear pivotally on an exterior rim of the can, and the other of which is disposed thereafter to bear pivotally on an interior



rim portion of the closure, whereby the closure is deflected away from the can exterior and about an inner hinge locality.

3,954,031

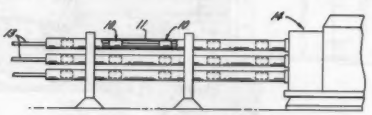
SOUND-DEADENING DEVICE

Mark E. Tull, and John H. Freis, both of Rockford, Ill., assignors to Frelun Engineering Company, Inc., Rockford, Ill.

Filed Sept. 12, 1975, Ser. No. 612,755

Int. Cl.² B23B *13/00*

U.S. Cl. 82—38 A **9 Claims**



1. In combination, a feed tube for guiding bar stock into a machine, a plurality of resiliently flexible bristles secured within said tube and extending inwardly from the interior surface of said tube and toward the central axis thereof in a generally radial direction a distance substantially less than the length of the radius of said tube, said bristles serving to support said bar stock within the tube and away from said interior surface thereby to deaden the sound caused by the bar stock as the latter is rotated and fed through the tube during operation of the machine.

3,954,032

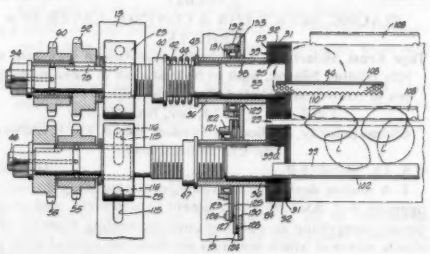
CITRUS PEEL OIL EXTRACTOR FOR WHOLE FRUIT

Franklin K. Holbrook, Whittier, Calif., assignor to Brown International Corporation, Covina, Calif.

Continuation-in-part of Ser. No. 207,482, Dec. 13, 1971, abandoned. This application Dec. 3, 1973, Ser. No. 421,104

Int. Cl.² A23N *1/00*; **A47J** *19/02*

U.S. Cl. 83—2 **8 Claims**



1. Apparatus for extracting oil from the peel of whole citrus fruit, comprising in combination: a pair of parallel horizontal toothed rolls forming a bight between them for reception and support of whole citrus fruit, means for rotating said rolls in the same direction to spin the fruit, an axially extending stationary inclined wall adjacent one of said rolls, and an axially

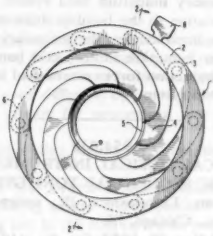
extending bar mounted to travel in an orbital path over said bight, in a plane generally parallel to the plane containing the axes of said rolls and at an elevation above said bight to engage fruit thereon, means for moving said bar in said orbital path whereby said bar will contact the fruit intermittently above the rolls to move the fruit out of the bight into contact and axially along said wall to re-enter the same bight at an axially spaced location.

3,954,033

METHOD AND APPARATUS FOR CUTTING CYLINDERS OF GELATINOUS MATERIALS INTO DISCS OF PRECISE THICKNESS

Harold W. Tipton, Woodbridge, and John I. Peterson, Falls Church, both of Va., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed June 27, 1974, Ser. No. 483,872
Int. Cl.² B26D *5/10*
U.S. Cl. 83—51 **4 Claims**



1. A method of slicing cylinders of unfrozen gelatinous material into discs of relatively precise thickness, consisting of the steps of:

placing an aperture-shaped slicer in contact with the unfrozen gel cylinder around the entire circumference of the cylinder at a desired axial position determined by the desired thickness of the disc; and

moving the slicer inward radially from all points about the circumference substantially simultaneously at a uniform rate until the aperture of the slicer is substantially closed.

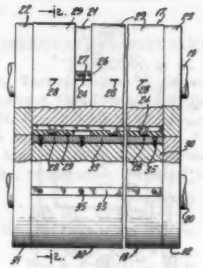
3,954,034

ROTARY CUTTING MECHANISM

Frank William Broderick, New Providence, N.J., assignor to Standex International Corporation, Andover, Mass.

Filed Apr. 25, 1974, Ser. No. 464,009
Int. Cl.² B26D *1/40*
U.S. Cl. 83—117 **2 Claims**

1. A rotary cutting mechanism for the register cutting of intermittent slits in flexible sheet material comprising: a first roll and a second roll mounted adjacent each other with their axes parallel, the first roll having a plurality of blades removably mounted at spaced intervals about the periphery of the roll, each of said blades being mounted parallel to the axis of said first roll and extending outwardly therefrom, each of said blades having a plurality of cutting edges at spaced intervals along the length of the blade and extending outwardly from the periphery of said first roll, resilient material mounted on the periphery of said first roll and extending between cutting edges on adjacent blades, said first roll having steel bearer members mounted at each end of the roll, said bearer members having the same diameter as the diameter of said first roll measured at the outer edge of the cutting edges, the second roll having a plurality of adjustable and removable platen bars mounted about the periphery of the second roll, each of said platen bars extending the length of the roll and being mounted parallel to the axis of said second roll, said platen bars being spaced apart the same distance as said blades on the first roll, said second roll having steel bearer members mounted at each end of said roll, said bearer members having the same diameter as the diameter of the second roll measured at the outer



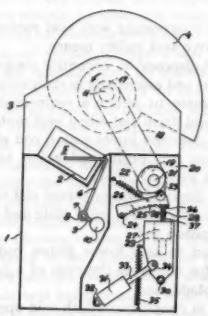
surface of said platen bars, said rolls rotating at the same peripheral linear speed and being positioned with respect to each other so that a cutting blade on said first roll comes into face-to-face relationship with a platen bar on said second roll at the nip formed by a pair of rolls.

3,954,035

SLICING MACHINE HAVING FEED MEANS SYNCHRONIZED WITH KNIFE ROTATION

Bent Hauberg, Birkerod, Denmark, assignor to Lynggaard Skandinavia, Copenhagen, Denmark

Filed Apr. 16, 1975, Ser. No. 568,472
Claims priority, application Germany, Apr. 18, 1974, 2418640
Int. Cl.² B26D *5/20*
U.S. Cl. 83—207 **5 Claims**



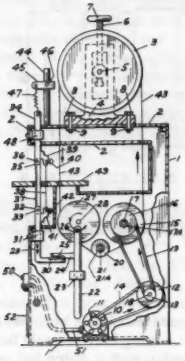
1. A slicing machine comprising a rotating knife and an advancing means for the object to be sliced, said advancing means being movable substantially perpendicular to the plane of rotation of the knife by means of a hydraulic cylinder, characterized by a piston pump, means for driving said piston pump in synchronization with the relative movement of the knife and the object in the plane of rotation of the knife by which the object is cut up in such a manner that the piston pump performs a stroke for each cutting operaton, said piston pump feeding hydraulic fluid to the cylinder during the advance of the object for stepwise advancing the cylinder plunger connected to the advancing means.

3,954,036

COMBINATION SAW

Otto Mathias Andreas Bech, Arhus C., Denmark, assignor to James L. Brown, Shreveport, La.

Filed June 13, 1975, Ser. No. 586,669
Int. Cl.[2] B23D *57/00;* **B27B** *13/00, 19/06*
U.S. Cl. 83—749 **10 Claims**



1. A combination saw compising:
a. a frame;
b. a motor mounted on said frame;
c. a frame arm carried by the upper portion of said frame and a work plate carried by the lower portion of said frame and disposed opposite said frame arm, said work plate having at least one aperture therein;
d. an overhead pulley carried by said frame arm in vertical, adjustable relationship;
e. pulley means disposed in vertical relationship opposite and in alignment with said overhead pulley and below said work plate;
f. a continuous band saw blade traversing said overhead pulley, said pulley means and said aperture in said work plate;
g. belt means cooperating with said motor and said pulley means to drive said pulley means;
h. a drive rod disposed in eccentric cooperation with said pulley means and essentially in reciprocating cooperation with said frame to effect a reciprocating and rocking motion of said drive rod when said motor is activated;
i. a vertically disposed lower piston rod movably mounted on said frame and positioned below said work plate in cooperation with said drive rod;
j. a vertically disposed upper piston rod movably mounted on said frame above said work plate and in alignment with said lower piston rod;
k. means fitted to said lower piston rod and said upper piston rod for receiving the ends of a jigsaw blade and a scroll saw blade; and
l. bias means in cooperation with said upper piston rod for biasing said upper piston rod in an upward, vertical position.

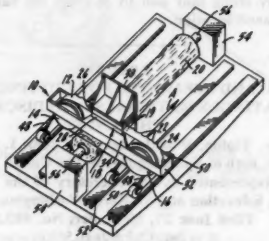
3,954,037

LINEAR MOTOR BAND SAW

Guillermo Baez Rios, Mexico City, Mexico, assignor to Emilio Retana Rodriguez, Mexico City, Mexico

Filed July 9, 1975, Ser. No. 594,540
Int. Cl.[2] B27B *13/00*
U.S. Cl. 83—794 **13 Claims**

1. A linear motor driven band saw comprising a continuous, electrically conductive band carrying a plurality of cutting teeth along at least one edge,
a pair of spaced support pulleys about which the band is mounted for continuous motion, and
a linear induction motor for supplying power to drive the band saw, said motor comprising a stationary induction field system as the primary driving element of the motor,



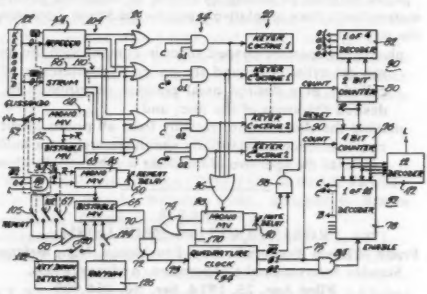
which stationary induction field system is mounted in operative relation to the band to drive it about the pulleys, and the band itself as the secondary driven element of the linear induction motor, said band being driven directly by induction forces established in the stationary induction field system.

3,954,038

ELECTRICAL MUSICAL INSTRUMENT WITH AUTOMATIC SEQUENTIAL TONE GENERATION

Roman A. Adams, Lincolnshire, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed Nov. 23, 1973, Ser. No. 418,577
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.01 **9 Claims**

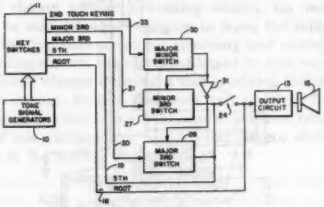


1. An electrical musical instrument comprising:
a plurality of tone producing means each actuatable to produce a different tone;
selection means for producing a number of signals representing a corresponding number of the tone producing means which are to be actuated;
a plurality of plural input gates each actuatable when signals are present at the plural inputs thereof, each gate having one input coupled to the selection means and an output coupled to a different one of the plurality of tone producing means for actuation thereof;
cycle means coupled to the other inputs of the gates for generating signals which will actuate in sequence the plurality of gates when signals are also present at the one inputs thereof; and
tone interval means including a monostable multivibrator effective to stop the cycle means when any one of said gates is actuated to maintain actuation thereof for a predetermined period, said predetermined period of time being the same for each of said gates whereby the different tones produced are of substantially equal duration.

3,954,039
CHORD SELECTION SYSTEM FOR A MUSICAL INSTRUMENT

James S. Southard, Union, Mich., assignor to C. G. Conn, Ltd., Elkhart, Ind.

Filed Jan. 30, 1975, Ser. No. 545,355
Int. Cl.² G10H 1/00, 5/02
U.S. Cl. 84—1.01 8 Claims



1. In an electronic organ,

at least one playing key corresponding to a predetermined root note tone to be produced by said organ, said playing key capable of movement from a rest position to at least first and second different operated positions;

a utilization circuit for processing tone signals applied thereto;

tone signal generating means for generating a plurality of tones;

a plurality of first switch means coupled with said tone signal generating means and responsive to movement of said playing key to the first operated position thereof for supplying a unique plurality of tone signals from said tone signal generating means to said utilization circuit;

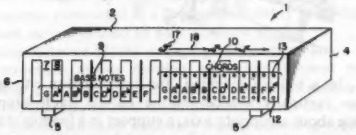
gating circuit means coupled with at least some of said first switch means for controlling the application of tone signals therefrom to said utilization circuit; and

second switch means coupled with said gating circuit means and responsive to movement of said playing key to the second operated position thereof for selectively controlling the operation of said gating circuit means to thereby control the application of tones therethrough from said first switch means to said utilization circuit.

3,954,040
SYSTEM AND APPARATUS FOR KEYBOARD INSTRUCTION IN PLAYING CHORDS IN 3-4 OR 4-4 TIME

Arthur R. Schmoyer, Rte. 16, Woolford, Md. 21677

Filed May 16, 1975, Ser. No. 578,032
Int. Cl.² G09B 15/08
U.S. Cl. 84—478 10 Claims



1. An apparatus for instruction in the playing of chords on a musical instrument including a keyboard, said apparatus comprising

mounting means positionable upon first and second octaves of the instrument keyboard, said mounting means including

sensing means responsive to the depression of keys of said first octave of said keyboard to derive a signal, display means including chord note identity indicators each of which is visually associated with a particular key of said second octave of said keyboard, said apparatus further comprising

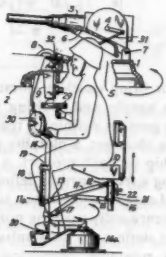
means responsive to said signal derived from sensing a particular key to activate a certain plurality of said chord identity indicators, and

means effective to latch said plurality of chord identity indicators in said activated state.

3,954,041
MILITARY OBSERVATION POST SUCH AS A GUN TURRET

Andre Mechulam, Tarbes; Bruno M. Saintours-Payerne, St. Etienne; Guillaume A. Gay-Chatain, St. Etienne, and Paul R. Montjallard, St. Etienne, all of France, assignors to Etat Francais, Paris Armees, France

Filed Mar. 15, 1974, Ser. No. 451,602
Claims priority, application France, Mar. 30, 1973, 73.11480
Int. Cl.² F41H 5/20
U.S. Cl. 89—36 K 9 Claims

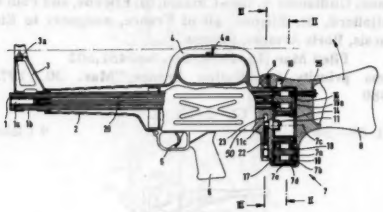


1. A military observation post comprising a structure defining an inner compartment for an operator, said structure having an observation opening allowing passage of the head of the operator therethrough, an external viewing device mounted on said structure outside said compartment, an internal viewing device mounted within said compartment parallel and below said external viewing device and of greater precision than the external viewing device, a seat in said compartment on which the operator can be seated, support means connecting said seat to said structure for movement betweeen an elevated position at which the operator is at the level of the external viewing device and a lowered position at which the operator is at the level of the internal viewing device, and locking means actuated by the operator from within the compartment for locking the seat in said positions and for selectively unlocking the seat to permit the seat to travel to the other position, said support means including a mast mounted on said structure, biassing means on said mast for urging the seat from the lowered to the raised position when the locking means is unlocked and the weight of the observer is relieved from the seat, said seat being lowered from the raised to the lowered position by the weight of the observer and in opposition by the biassing means when the locking means is unlocked, whereby in going from the raised to the lowered position the operator remains in seated position on the seat, said locking means comprising a foot pedal supported within said compartment in a position to be actuated by a foot of the seated operator in the elevated position of the seat, said support means comprising a quadrilateral linkage including a pair of arms, one arm being connected to said seat and to said mast, the other arm being connected to said seat and to said biassing means, the connection of said other arm to the biassing means being displaceable during movement to the seat and constraining such movement of the seat to be substantially vertical between said parallel viewing devices.

3,954,042
FIREARM CONSTRUCTION, PARTICULARLY A COMPACT HAND FIREARM

Gerhard Hupp, Oberndorf (Neckar), and Helmut Mader, Schramberg, both of Germany, assignors to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Karlsruhe, Germany

Filed Mar. 8, 1974, Ser. No. 449,458
Claims priority, application Germany, Mar. 19, 1973, 2313591
Int. Cl.² F41D 7/04
U.S. Cl. 89—155 **15 Claims**



1. A firearm for firing caseless ammunition, comprising a support having a handle and a firing trigger adjacent said handle and a rear portion defining a rearwardly opening portion of a magazine chamber, a plurality of barrels arranged in parallel relationship on said support, a butt secured to said support and having a front portion defining a forwardly opening portion of said magazine chamber, said forwardly opening portion and said rearwardly opening portion of said magazine chamber together defining a substantially cylindrical magazine chamber, a rotatable cylindrical magazine rotatably mounted in said magazine chamber between said butt and said support and having a plurality of radially spaced circumferentially extending rows of cartridge receiving bores adapted to be indexed into association with each barrel, means associated with said magazine for sealing the bore during the firing of the cartridges, a control bore defined in said support adjacent said barrels having a connection with said barrels for the passage of pressure gases therethrough to said control bore during the firing of said cartridges, and a control piston in said control bore movable transversely to said barrels and connected to said magazine and movable by the gases during firing to rotate said magazine to index respective bores into alignment with said barrels.

3,954,043
METHOD AND APPARATUS FOR CLAMPING AND MILLING WORK IN A LATHE

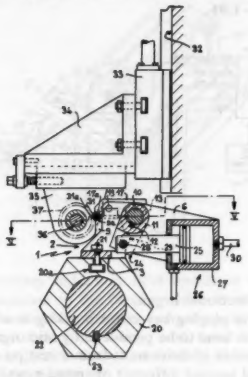
Paul Maitre, 74100 Annemasse (Haute-Savoie), France

Filed May 13, 1975, Ser. No. 577,132
Claims priority, application France, May 14, 1974, 74.17387
Int. Cl.² B23C 7/02; B23B 25/00
U.S. Cl. 90—11 C **5 Claims**

1. The method of transversely milling a work piece in one of the index positions of an automatic multi-spindle lathe, including the steps of: advancing a head having work-clamping jaws toward the work piece located in said one index position until the jaws surround the work piece, stopping rotation of the work piece, clamping the work piece in the jaws, then advancing a carriage carrying a milling tool to the work piece and milling the work piece, returning the carriage to its rest position, releasing the jaws, and returning the head to its rest position, and advancing the lathe to its next index position.

2. Milling apparatus for use in combination with a multi-spindle turret lathe of the type supporting work pieces in the multiple-spindle positions and including means to sequentially index the spindle positions of the lathe about a central axis extending parallel to the spindles, comprising:

a. a head movable along said central axis from a rest position to a position opposite the work piece in one selected index position, and the head including a work piece clamping device;



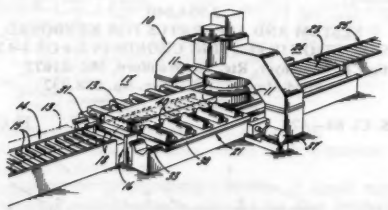
b. a carriage including milling cutter means mounted on the lathe and movable transversely of said central axis from a rest position to a milling position wherein the milling cutter engages the work piece then occupying said selected index position; and

c. control means operative in response to operation of the clamping device to enable the advance of the milling cutter carriage to said milling position.

3,954,044
OVER AND UNDER MILLING MACHINE

William F. Ridgway, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed Jan. 13, 1975, Ser. No. 540,500
Int. Cl.² B23C 9/00, 1/04
U.S. Cl. 90—21 D **2 Claims**



1. In a milling machine, the combination of, upper and lower vertically spaced milling cutters each supported to rotate about an upright axis, a support in a loading station, and a carriage adapted to pick up a slab on said support and to advance the slab to an unloading station along a horizontal path extending between said cutters thereby to enable simultaneous milling of the upper and lower surfaces of the slab during such advance, said carriage comprising a pair of horizontally spaced members disposed on opposite sides of said path and mounted to move back and forth between said stations, said carriage further including horizontally projecting clamps on said members, the clamps on each of said members projecting toward the clamps on the other member and being arranged in a row extending along said path, the clamps on each member being movable toward the clamps on the other

member to clamping positions and being movable away from the clamps on the other member to released positions, said clamps being operable when in said clamping positions to engage the laterally facing sides of a slab on said support and hold the slab for movement with said members, means for moving said clamps to said clamping positions, for effecting relative vertical shifting between said slab and said support to space the slab vertically above the support, for moving said carriage and the clamped slab past said cutters from said loading station to said unloading station, for moving said clamps to said released positions to leave the milled slab in said unloading station and for returning said carriage toward said loading station, the carriage formed by said members and the released clamps defining a slab-receiving throat which is open at its top, bottom and ends and which is free of any slab-engaging obstruction that would prevent return movement of said carriage into said loading station while a slab is located in the loading station.

3,954,045

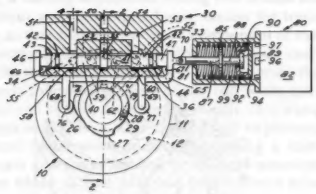
ROTARY ACTUATOR VALVE

Roland J. Barlow, Madison Heights, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 10, 1974, Ser. No. 459,495

Int. Cl.² F15B *9/10, 13/16, 13/044*

U.S. Cl. 91—382 **9 Claims**



1. A fluid operated reciprocating rotary actuator with less than 360° rotation having an integral vane and shaft in combination with a control valve providing a degenerative pressure/force response connected to a solenoid assembly comprising:

a. a cam means affixed to said actuator shaft,

b. a cam follower means engaging said cam means,

c. a structure means holding said cam follower means against said cam means, and said structure means connected directly to both ends of said control valve means and to said solenoid assembly means effecting feedback between said cam means, said valve means and said solenoid means,

d. an electrical solenoid affixedly held in a housing means and plunger means operatively moveable by energizing and de-energizing said solenoid means,

e. a shaft means controlled by said plunger means,

f. spring housing means affixed to said solenoid housing means,

g. spring retaining means, and

h. spring means within said spring housing means cooperating with said shaft means, said spring housing means and said spring retaining means.

3,954,046

VALVE ARRANGEMENT FOR CONTROLLING A REVERSIBLE HYDRAULICALLY OPERATED DEVICE

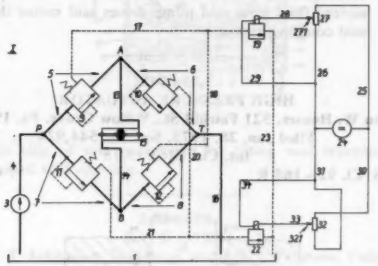
Bruno Stillhard, St. Gallen, Switzerland, assignor to Gebrueder Buehler AG, Switzerland

Filed Mar. 13, 1974, Ser. No. 450,799

Claims priority, application Switzerland, Mar. 14, 1973, 3628/73

Int. Cl.² F15B *13/16, 13/043*

U.S. Cl. 91—361 **12 Claims**



1. In a valve arrangement including four main control valves connected in respective arms of a bridge circuit for controlling a reversible hydraulically operated device, with the bridge circuit being connected, at one end of a first diagonal, to a source of fluid under pressure and, at the other end of its first diagonal, to a fluid reservoir, and being connected, at opposite ends of a second diagonal, to inlet and outlet ports of the operated device, the valve arrangement including respective pilot-control equipments each operatively associated with a respective pair of the main control valves for determining the direction and magnitude of the fluid pressure: the improvement comprising, in combination, four pressure-controlled valves constituting said main control valves and continuously pilot-controllable; each pilot control equipment comprising a respective pressure adjusting valve; and respective control lines connecting each pressure adjusting valve to a respective pair of main control valves.

3,954,047

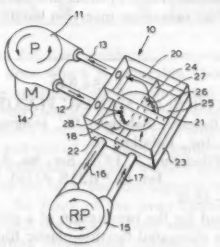
TRANSMISSION COUPLING APPARATUS

Jack K. Miniere, 685 Minnesota Ave., Winter Park, Fla. 32789

Filed Feb. 18, 1975, Ser. No. 550,355

Int. Cl.² F15B *13/04*

U.S. Cl. 91—467 **4 Claims**



1. A fluid coupling comprising in combination:

a fluid pump having an input and output;

a fluid motor having an input and an output;

coupling means coupling said fluid pump to said fluid motor whereby pressurized fluid from said fluid pump can drive said fluid motor;

coupling means having a first pair of chambers and a second pair of chambers separated by a rotatable chamber separating control member, said control member having a plurality of openings therethrough at predetermined locations thereby interconnecting at least one first and second chamber; and

said fluid pump input operatively connected to one first chamber and said fluid pump output operatively connected to the other first chamber and said fluid motor input being operatively connected to one said second chamber and said fluid motor output being operatively connected to said other second chamber whereby pressurized fluid from said pump drives said motor through said coupling means.

3,954,048

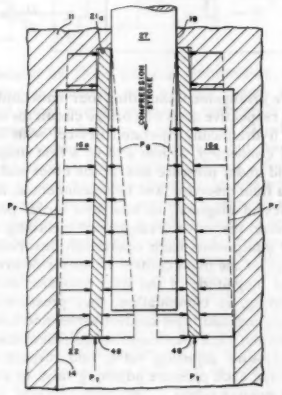
HIGH PRESSURE ACTUATOR

John W. Houser, 521 Fairhill St., Willow Grove, Pa. 19090

Filed Jan. 28, 1975, Ser. No. 544,924

Int. Cl.² F16J *15/18*

U.S. Cl. 92—165 R **7 Claims**



1. A self-sealing hydraulic pump, comprising:

a housing forming a cavity;

a valve manifold operatively connected to said housing for controlling fluid flow to and from said cavity;

a thin wall cylinder within said cavity sealingly secured at one end to said housing forming a space in said cavity around the outer surface of said cylinder freely communicating to within said cylinder; and

a piston slidable in said cylinder and having a uniform diameter for the maximum insertion length from said one end thereof.

3,954,049

METHOD OF MAKING FLEXIBLE BAG

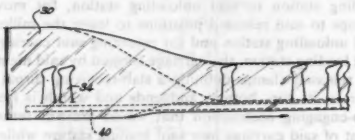
Bernard F. Brieske, Palatine, Ill., assignor to Vision Wrap Industries, Inc., Palatine, Ill.

Filed Nov. 9, 1973, Ser. No. 414,200

Int. Cl.² B31B *41/60*

U.S. Cl. 93—35 R **4 Claims**

1. A method for the production of a plurality of individual bags from an elongated flexible plastic film which is adapted to be heat sealed, comprising the steps of providing an elongated single thickness of film, providing a folding means and feeding said sheet to the folding means to thereby locate film portions thereof in overlying relationship, the edge of one film portion extending substantially beyond the edge of the other film portion to thereby provide an exposed single thickness film portion, introducing a flexible strip onto said exposed film portion, providing a second folding means and folding said exposed film portion to provide a return portion therein, positioning the free edge of said return portion adjacent and parallel to a free edge of said other film portion, the folding of said exposed film portion locating said strip within said return portion, heat-sealing said film portions together and to the edge of said strip adjacent said free edge of the return portion to thereby confine said flexible strip within the return



portion, thereafter severing bags one at a time while simultaneously heat-sealing the bags around the severed periphery thereof, said free edge of said other film portion remaining unsealed in each bag to permit the introduction of articles into the bag, and wherein said film and said strip are continuously fed in step-by-step fashion to the folding and heat-sealing means to provide for the continuous production of bags from the film.

3,954,050

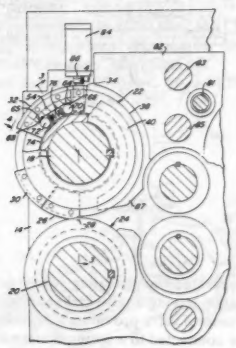
APPARATUS HAVING A QUICK-SET SLOTTER KNIFE

William Grobman, Philadelphia, Pa., assignor to Molins Machine Company, Inc., Camden, N.J.

Filed Sept. 11, 1974, Ser. No. 504,934

Int. Cl.² B31B *1/22*

U.S. Cl. 93—58.2 R **14 Claims**



6. Apparatus for slotting planar box blanks comprising a frame, a slotting head assembly on said frame, said assembly including a shaft mounted for rotation about its longitudinal axis, an annular head connected to said shaft for rotation therewith, said head being adjustable along the length of said shaft, a knife carrier supported by said head adjacent the outer periphery thereof for circumferential movement about the axis of said head, a slotter knife connected to said knife carrier, means for releasably locking said knife carrier to said head, and means for selectively releasing said locking means including an element mounted on said frame for movement from an inoperative position radially outwardly from said head to an operative position wherein said element extends to a position for release of said locking means and to hold said knife carrier stationary with respect to said head.

3,954,051
APPARATUS FOR CLIPPING WRAPPED ROD-LIKE FILLERS OF FIBROUS MATERIAL

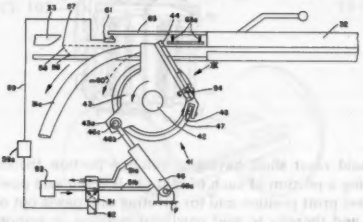
Wolfgang Steiniger, Hamburg, Germany, assignor to Hauni-Werke Koerber & Co. KG, Hamburg, Germany

Filed Oct. 29, 1974, Ser. No. 518,738

Claims priority, application Germany, Dec. 7, 1973, 2361001

Int. Cl.² A24C 5/50; B26D 1/56

U.S. Cl. 93—77 FT **14 Claims**



1. In a machine having means for producing a continuous rod wherein a rod-like filler of fibrous material is surrounded by a tubular wrapper, means for conveying the rod lengthwise along a predetermined path and in a predetermined direction, and means for severing the rod at predetermined intervals downstream of said producing means to thereby subdivide the rod into sections of desired length, the improvement which consists in the provision of an apparatus for separating the leader from the next-following portion of the rod intermediate said producing means and said severing means, said apparatus comprising a cutting implement having two blades and being turnable about a predetermined axis; means for transporting said blades so that said blades have a component of movement in said direction; and means for moving at least one of said blades across said path so that said blades separate the leader from the next-following portion of the rod while said blades are being moved by said transporting means, said transporting means comprising a device for turning said implement about said axis and said moving means comprising a cam which surrounds said axis and is tracked by follower means provided on said one blade so that said one blade moves across said path while said implement turns about said axis.

3,954,052
TILTABLE COOKING RECEPTACLE APPARATUS

Elmer S. Vegh, Lyndhurst, and Donald F. Klier, Parma, both of Ohio, assignors to Alco Standard Corporation, Cleveland, Ohio

Filed Feb. 22, 1974, Ser. No. 444,782

Int. Cl.² A47J 37/12

U.S. Cl. 99—407 **18 Claims**

1. A tiltable cooking receptacle apparatus comprising, a frame,

a receptacle supported on said frame for tilting movement in one direction between an upright position and a discharge position,

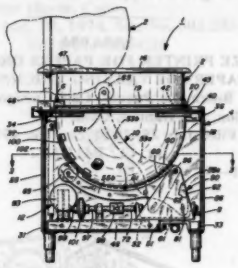
a tilting mechanism is mounted on said frame for tilting said receptacle,

said tilting mechanism includes a tilt arm for applying a lifting force to at least one side of said receptacle,

said tilt arm is mounted on said frame for movement in a direction opposite to the direction of pivotal movement of said receptacle between a lowered non-tilting position and a raised tilting position,

selectively actuatable drive means is operably connected to said tilt arm for moving said tilt arm between said lowered and raised positions to tilt said receptacle into said discharge position, and

said tilt arm is pivotally supported on said frame having one end disposed for camming coacting engagement with said



one side of said receptacle for tilting said receptacle toward said one side.

3,954,053
RACK OVEN

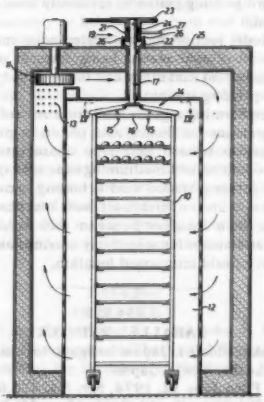
Leif A. T. Johansson, Huddinge, and Erik I. Peterson, Vallentuna, both of Sweden, assignors to Tipe Revent AB, Stockholm, Sweden

Filed Apr. 30, 1975, Ser. No. 573,375

Claims priority, application Sweden, May 6, 1974, 74060096

Int. Cl.² A21B 1/00, 3/02

U.S. Cl. 99—443 R **2 Claims**



1. Chamber oven for food products, comprising an oven chamber having a door which is swingable about a vertical axis; a movable, e.g. rotatable, support provided at the top of the oven chamber and coupled with a drive, which support is adapted to be releasably coupled with a rack which is horizontally movable into and out of the oven chamber, the support member also being shiftable between a lower position for the coupling together of the rack and the support with the rack resting directly on the floor of the oven chamber, and an upper position in which the rack is freely suspended from the support; and a shifting mechanism connected between the support member and the door and adapted upon swinging of the door to closed position to place the support member in the upper position and upon swinging of the door to open position to place the support member in the lower position, characterized in that the shifting mechanism includes a device for lifting the door of the oven chamber to an upper position under the

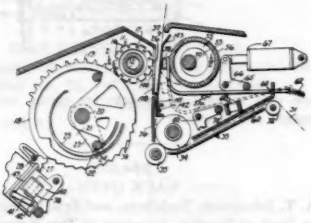
action of the weight of the rack upon the shifting of the support member to the lower position and for lowering the door to a lower position against the action of the weight of the rack upon the shifting of the support member to the upper position.

3,954,054

SQUEEZE PRINTER FOR PAPERS OR STACKS OF PAPERS OF VARYING THICKNESSES

Richard E. Busch, La Puente, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed July 25, 1974, Ser. No. 491,872
Int. Cl.² B41J 1/22
U.S. Cl. 101—93.1 B **6 Claims**



1. A data printer comprising
type members,
type characters on said members,
means for differentially setting said type members to position different ones of said type characters at a printing station,
a thin, hard printing platen of resiliently bendable (flexible) material,
means fixedly supporting said platen adjacent one end, the other end of said platen being free, a portion of said platen adjacent said other end facing said type characters at said printing station,
said platen forming a guide wall for a record medium,
actuating means for flexing said platen to press said other end portion toward said type characters and thereby impress said record medium against said type characters at said printing station said actuating means comprising an actuator and an interposer, said interposer being interposable in a location between said actuator and said platen and means for selectively moving said interposer in and out of said interposed location.

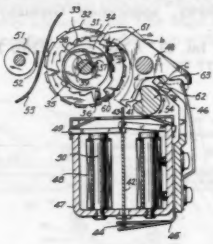
3,954,055

PARALLEL PRINTER

Seiji Hanaoka, Shiojiri, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 12, 1974, Ser. No. 478,675
Claims priority, application Japan, June 12, 1973, 48-65426
Int. Cl.² B41J 1/44
U.S. Cl. 101—99 **12 Claims**

1. In a parallel printer comprising at least two printing rings having print characters circumferentially positioned thereon, first rotation means for rotating each said printing ring in a first rotational direction from a printing ring rest position to a printing ring print position and a ratchet wheel mounted on the side of each said printing ring, to be rotated therewith, each said ratchet wheel including ratchet teeth, each said tooth circumferentially disposed to correspond with a print position of the print ring, the improvement comprising a pawl associated with each printing ring, pivot means coupled to each said pawl to selectively pivot each of said pawls from a pawl rest position to a pawl print position to selectively engage one of said ratchet wheel teeth in each said associated printing ring to stop the rotation of said print wheel thereby positioning said print characters at a print position for printing, and reset means for returning each of said pawls from a pawl print position to a pawl rest position, said reset means including an axially rotatable reset shaft and second rotation means for rotating said rotatable reset shaft from a reset shaft rest position, said reset shaft having a notched portion therein for receiving a portion of each of said pawls when said pawls are in a pawl print position and for pivoting said pawls out of said notch and thereby to said pawl rest position in response to rotation of said reset shaft from said reset shaft rest position.

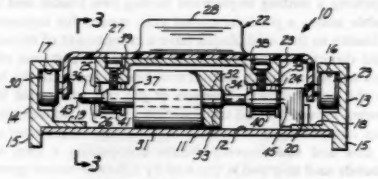


3,954,056

PLATEN POSITIONING MEANS FOR IMPRINTERS

William P. Barbour, Gaithersburg, Md., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 9, 1975, Ser. No. 566,560
Int. Cl.² B41F 3/04, 3/56
U.S. Cl. 101—269 **12 Claims**



1. An imprinter comprising: a base member having a bed portion for supporting a print device and a sheet over said print device, said print device being of the class having raised character surfaces; a carriage journaled to said base member for movement through an imprinting stroke in one direction and for movement through a return stroke in the opposite direction along said base member; a shaft having an axis, saiad shaft being supported by said carriage for movement with said carriage along said base member and also for axial movement relative to said carriage along said axis; cylindrical roller platen means supported by said shaft in coaxial relation to the shaft axis, for bearing against said sheet when said carriage is moved through said imprinting stroke and supported by said shaft in spaced relation to said sheet when said carriage is moved through said return stroke; said shaft having a first surface portion located a first predetermined distance from said axis and having a second surface portion located a second predetermined distance from said axis, one of said first and second distances being less than the other of said second and first distances; cam means supported by said base member for axially moving said shaft between first and second axial positions; and locating means supported by said carriage for bearing against said first surface portion of said shaft when said shaft is in its first axial position and for bearing against said second surface portion of said shaft when said shaft is in its second axial position to selectively raise and lower the axes of

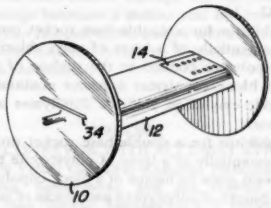
said shaft and roller platen means in relation to said bed portion.

3,954,057

RADIO CONTROLLED WING ROTOR BOMBLET

Abraham Flatau, Edgewood, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 28, 1966, Ser. No. 568,682
Int. Cl.² F42B 25/24
U.S. Cl. 102—3 10 Claims



1. A self-dispersing radio controlled wing rotor bomblet comprising in combination,

A. elongate wing rotor means of substantially rectangular cross section,

1. flight control means adapted for axial movement relative to said wing means mounted adjacent each end thereof,

2. radio controlled motor means mounted within said wing means and operatively connected to said control means,

3. electric power means mounted within said wing means adjacent to and operatively connected to said motor means,

B. end plate means coaxially secured to each end of said wing means,

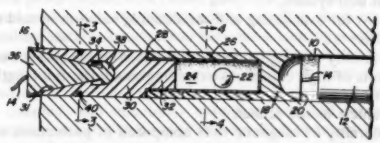
1. said end plate means having slot means adjacent the center thereof for receiving said control means when they are moved axially by said motor means.

3,954,058

COAL MINE SHOOTING PLUG

Barney Sanders, Box 24, and Wetzel R. Sanders, Box 32, both of Midkiff, W. Va. 25540

Filed May 3, 1974, Ser. No. 466,857
Int. Cl.² F42B 3/20
U.S. Cl. 102—30 8 Claims



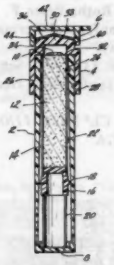
1. A multi-part plug including one part having a chamber with a steel ball sealed therewithin, a middle part secured to said first part and receiving a third part to seat the plug in a drilled hole, said chambered part also having a concussion cup facing an explosive charge, the middle part having a nose on one end, sealed to said chambered part, said third part including wedge means fitting into slit portions of said middle part to fix the plug within a drilled hole.

3,954,059

PYROTECHNIC SIGNAL WITH COLLAPSIBLE HANDLE

James D. Langseth, Devil's Lake, N. Dak., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 30, 1974, Ser. No. 502,255
Int. Cl.² F42B 4/26
U.S. Cl. 102—37.8 2 Claims



1. A hand-held pyrotechnic signal comprising:

a. a handle member formed of resilient plastic and having a cylindrical side wall, a closed end wall unitary and in one piece with said side wall, and an open mouth end;

b. a cylindrical pyrotechnic charge assembly telescopingly received in said handle member, said charge assembly having a bottom end disposed recessed within said handle member, and an ignition end disposed in the area of said open mouth end of said handle member;

c. means in said handle member engaging said pyrotechnic charge assembly to hold said bottom end thereof spaced apart from the closed end wall of said handle member whereby a free space is formed in said handle member;

d. cooperating annular rib and recess retaining means for holding said pyrotechnic charge assembly in an extended position with respect to said handle member when the former is pulled out of the latter, one of said rib and recess being formed on said pyrotechnic charge assembly near the bottom end thereof and the other of said rib and recess being formed on said handle member near the open mouth end thereof; and

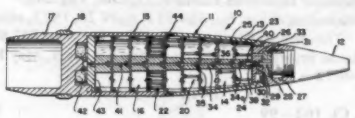
e. removable closure means forming a water tight cap over said open mouth end of said handle member.

3,954,060

PROJECTILE

Charles W. Haag; John Metz, Jr., and John J. Voda, all of Evansville, Ind., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 24, 1967, Ser. No. 665,192
Int. Cl.² F42B 13/50
U.S. Cl. 102—69 20 Claims



1. Projectile means comprising:

a casing having a nose, a front portion defining a front bay, and a rear portion defining a rear bay;

a first plurality of flechettes in said front bay;

a second plurality of flechettes in said rear bay;

means for separating said front portion from the projectile in flight to expose said front bay and free said first plural-

ity of flechettes for flight independently of said casing; and

means for ejecting said second plurality of flechettes forwardly and outwardly from said second bay for flight independently of said casing.

3,954,061

SAFETY DEVICE ON ELECTRIC PROJECTILE FUSES

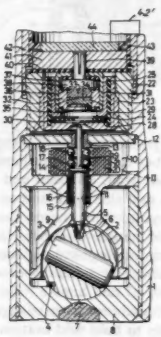
Werner Rüdenauer, Roth; Peter F. Weidner, Nurnberg, and Dietmar Stutzle, Lauf, all of Germany, assignors to Diehl, 85 Nurnberg, Germany

Filed June 11, 1974, Ser. No. 478,281

Claims priority, application Germany, June 13, 1973, 2330013

Int. Cl.² F42C *11/02, 15/22*

U.S. Cl. 102—70.2 GA 10 Claims



1. In a fuse device for a projectile; a firing pin in the form of a primer pin axially displaceable in the projectile, a detonator cap near one end of the primer pin adapted to be ignited by impact of the primer pin thereon, a source of electrical energy, an electrically ignitable propelling charge at the other end of the primer pin operable when ignited to drive the primer pin into impact with said detonator cap, spaced electrical contacts between said source and said propelling charge adapted to be bridged by said primer pin, means biasing said primer pin toward contact bridging position, latch means normally holding said primer pin in spaced relation to said contacts, means responsive to rotation of the projectile when propelled from a barrel to disengage said latch means thereby to permit said primer pin to contact bridging position, and means operable upon impact of said projectile for actuating said source thereby to ignite said propelling charge.

3,954,062

CASELESS PROPELLANT CHARGES

James Littlejohn Dunlop, Kilmarnock, and Robert Reid Stevely, Saltcoats, both of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 354,911, April 26, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 507,962

Claims priority, application United Kingdom, May 12, 1972, 22340/72

Int. Cl.² F42B *1/00;* C06B *21/00*

U.S. Cl. 102—99 9 Claims

1. A method of preparing a unitary caseless propellant charge, comprising forming an integral mass of propellant composition containing particles of a removable filler, leaching out the filler particles to produce voids in the composition and to form an integral dry mass of porous propellant composition, compressing said integral porous mass to an average pressure of at least 1,000 psi to reduce the volume of the mass at least 20% thereby rendering the resulting charge more brittle and firable so that it disintegrates to a greater extent when subjected to shock from a priming charge.

4. A brittle friable unitary caseless propellant charge produced by the method of claim 1.

3,954,063

NOVEL INHIBITOR SYSTEM FOR DOUBLE-BASE PROPELLANT

Martin H. Kaufman, China Lake, and Bernard Wasserman, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 9, 1974, Ser. No. 530,916

Int. Cl.² F42B *9/14*

U.S. Cl. 102—103 4 Claims

1. An inhibitor for a double-base rocket propellant grain consisting essentially of a layer of vinyl chloride-vinylidene chloride copolymer bonded to the surface of said grain by means of a block copolymer adhesive containing blocks of vinyl chloride-vinylidene chloride copolymer and blocks of polyurethane.

2. An inhibitor for a double-base rocket propellant grain consisting essentially of a layer of polystyrene bonded to the surface of said grain by means of a block copolymer adhesive containing blocks of polystyrene and blocks of polyurethane.

3,954,064

RAPID TRANSIT SYSTEM

Michael A. Minovitch, Los Angeles, Calif., assignor to Gravity Transit Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 438,230, Jan. 31, 1974. This application May 3, 1974, Ser. No. 466,609

Int. Cl.² B61B *13/10*

U.S. Cl. 104—138 R 32 Claims

1. A rapid transit system comprising:

a plurality of stations;

tunnels extending underground between adjacent stations of said system;

means for evacuating and maintaining vacuum in said tunnels;

a plurality of magnetic rails composed of permanent magnets of high coercivity extending along the full length of the tunnel;

a vehicle in the tunnel;

a plurality of magnetic rails composed of permanent magnets of high coercivity extending lengthwise on the vehicle for levitating the vehicle above the tunnel's magnetic rails by magnetic repulsion so that no part of the vehicle is in physical contact with any part of the tunnel when it is moving between stations;

permanent magnet guidance rail means extending along the tunnel;

self-stabilizing, permanent magnet guide means on the vehicle in repelling spaced relationship with the guidance rail

means for maintaining the vehicle's levitating magnetic rails properly aligned over the tunnel's levitating magnetic rails;

said vehicle being propelled essentially entirely by gravity when moving from one station to another station at equal elevations where acceleration propulsion is obtained by coasting down one sloping arc of the vacuum tunnel, thereby converting gravitational potential energy into kinetic energy, and where deceleration is obtained by coasting up another sloping arc of the tunnel, thereby converting kinetic energy back into gravitational potential energy to be used later for making the next trip;

means for starting and stopping said vehicle in the immediate vicinity of each station; and

an air lock at each station through the vacuum tunnel to allow passage between a station and the interior of the vehicle when stopped at the station without removing the vacuum environment from the tunnel surrounding the vehicle at the station.

3,954,065

OVERHEAD CONVEYOR WITH ACCUMULATION DOCK

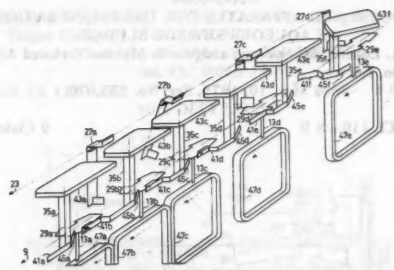
Harm Frank te Velde; Gerardus Antonius Hafkenscheid, both of Eindhoven, Netherlands, and Jan Marius Nierstrasz, Hsin-chu, China /Taiwan, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 195,089, Nov. 3, 1971, abandoned. This application May 28, 1974, Ser. No. 473,775

Claims priority, application Netherlands, Nov. 6, 1970, 7016261

Int. Cl.² B61B *13/00*

U.S. Cl. 104—172 S **7 Claims**



1. An overhead conveyor with an accumulation dock comprising crabs arranged for travel within a main track, said crabs comprising a coupling element rigidly secured thereto, driven pawls carried on a closed guide track extending parallel to said main track, the pawls and the coupling elements being movable relative to each other between a locking position and an unlocking position for detachable coupling of the crabs to the pawls, pawl engagement means carried by said coupling element for receiving said pawl when said pawl and element are coupled, and uncoupler members mounted for pivotal movement about a stationary vertical shaft between rest and operative positions and arranged along the path of movement of the crabs and the pawls for controlling the relative locking movements of the pawls and the coupling elements, said uncouplers being movable into a rest position by engagement with said pawls in which position a pawl moving past said uncoupler will not cause uncoupling of the crab and pawl, and into an operative position by engagement with the coupling elements, in which position a part of said uncoupler member will engage said pawl to cause uncoupling.

3,954,066

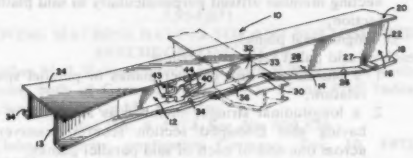
DRAFT SILL ARRANGEMENT FOR FLAT CAR

James C. Heap, Munster, Ind., assignor to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Dec. 12, 1974, Ser. No. 531,913

Int. Cl.² B61D *17/00*

U.S. Cl. 105—416 **8 Claims**



1. In a railway vehicle having a reinforced underframe including a continuous center sill extending the length of the vehicle and including end draft sills each being connected to transition beam members which connect a deep section center sill beam, a draft sill to transition beam connection for distribution of longitudinal forces, the improvement comprising:

each draft sill having spaced webs connected to a top cover plate and also including an end section comprising an outwardly opening bellmouthed section and said draft sill also including laterally extending bottom flange portions;

each transition beam member including vertically extending web members attached to a bottom cover plate having side flange portions extending outwardly of said webs, and said transition beam also including a bottom cover extension which extends horizontally beneath and is attached to the draft sill spaced webs;

each transition beam having a generally wedge-spaced contour forming a connection between the deep section center sill beam and the associated shallower beam draft sill;

said draft sill bottom flange portions including overlapping horizontal segments disposed to overlie the bottom cover extension of the transition beam and being attached thereto, thereby forming a reinforced draft sill box beam section for transmitting and absorbing longitudinal forces and vertical bolster loads.

3,954,067

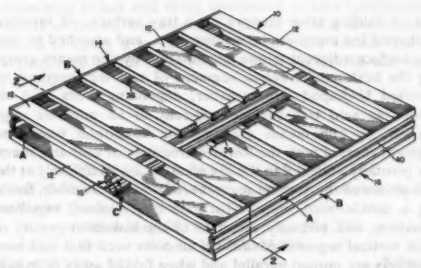
REVERSIBLE PALLET

Ray P. Miles, 8575 Melody Lane, Macedonia, Ohio 44056

Filed Nov. 22, 1974, Ser. No. 526,305

Int. Cl.² B65D *19/38*

U.S. Cl. 108—57 **4 Claims**



1. A reversible metal pallet comprising a pair of parallel faces spaced apart and secured together by stringers, said pallet constructed from four basic components as follows:

A. longitudinal end stringer members, each comprising an L-shaped section and a male connecting member affixed

perpendicularly to the outside of one leg of the L-shaped section,

B. longitudinal end stringer members, each comprising an L-shaped section and a female connecting member affixed perpendicularly to the outside of one leg of the L-shaped section,

C. longitudinal intermediate stringer members, each comprising a platform section and an offset U-shaped connecting member affixed perpendicularly to said platform section,

D. longitudinal planks,

each of said pallet faces comprising:

1. a plurality of said parallel planks in parallel spaced relation,
2. a longitudinal stringer member as set forth in (A) having said L-shaped section secured transversely across one end of each of said parallel planks,
3. a longitudinal stringer member as set forth in (B) having said L-shaped section secured transversely across the opposite end of each of said parallel planks,
4. a longitudinal stringer member as set forth in (C) having said platform section secured transversely across an intermediate underportion of each of said planks,

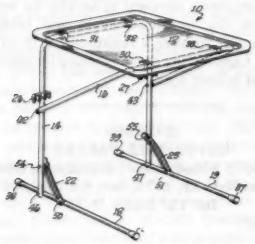
said pallet faces secured in opposite parallel spaced relation by respective male members interlocked with respective female members, and also be interlocked respective offset U-shaped members, and said components secured together at several places at their junctures.

3,954,068

FOLDING TABLE

Donald Lester Roberts; Sadie Roberts; Brenda Jo Roberts, and Deborah Ann Roberts, all of 2697 E. 55th Way, N. Long Beach, Calif. 90805

Filed Apr. 9, 1975, Ser. No. 566,191
Int. Cl.² A47B 3/00
U.S. Cl. 108—124 **3 Claims**



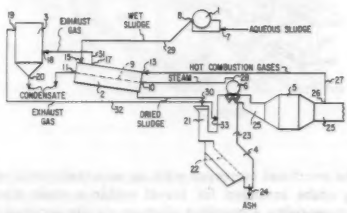
1. A folding table comprising a tray surface, an inverted U-shaped leg member, depending from, and attached to said tray surface adjacent to one edge thereof by clip means grasping the horizontal traverse segment of said leg member, an inverted U-shaped arm member, depending from, and attached to said tray surface adjacent to an opposite edge thereof, by clip means grasping the horizontal transverse segment thereof with the lower extremities of said arm member pivotally attached to the leg member approximately at the mid-points of the vertical segments of said leg member, forming a cantilevered support for said tray surface, two base members, one pivotally attached to the lowest extremity of each vertical segment of said leg member such that said base members are mutual parallel and when folded away from said leg segments about the pivot points, orthogonally intersect the line joining said pivot points on the two vertical leg segments, said pivot points on said base members being situated such that approximately four-fifths of said base members extends beneath the tray surface, two brace members, one pivotally attached to each base member in a direction toward the arm member supported edge of the cantilevered tray surface, with the brace members being of the standard slotted type having enlarged circular areas near the ends opposite the pivots to engage the interim diameter of studs affixed to each vertical leg segment at a distance above the lowest extremity of said segments equal to the separation of the brace and base to leg pivot points along the base members, said braces locking said base members at right angles to said vertical leg segments by spring action, two clip members, each formed generally as a rectangular parallelopiped, having three equally spaced circular cross-section grooves formed, transverse to the long dimension, on one surface, with slightly more than half the circular section embedded into said clip member, and having the outer corners of the surface opposite the grooves aesthetically rounded, one of said clip members being rigidly attached to each vertical leg segment, said leg segment passing through the central of the three grooves, above the aforementioned arm member pivot points, at a distance not exceeding that which would permit the folded base members from engaging one of the outer grooves in said clip member, and four "cane tip" type protective caps, one placed over each end of each base member, the entire structure being supported by the base members placed horizontal on a reference surface, thereby holding the leg member in a vertical position and thereby supporting the tray surface in a horizontal plane, said structure being capable of folding such that the base members pivot internal to the separation between the vertical segments of the leg member, being held parallel to said segments by the clip members, and the arm member pivots external to said leg member segments, also to be held vertical by said clip members, with the tray surface forming a nearly vertical plane adjacent to the plane of the folded structure, said tray surface being attached by clip means to the horizontal transverse segment of the arm member.

3,954,069

PROCESS AND APPARATUS FOR THE INCINERATION OF AQUEOUS SEWAGE SLUDGE

Per A. Loken, Ski, Norway, assignor to Myrens Verksted A/S, Oslo, Norway

Filed Mar. 10, 1975, Ser. No. 557,070
Int. Cl.² F23G 5/04
U.S. Cl. 110—8 R **9 Claims**



1. A process for the incineration of aqueous sewage sludge such as from community sewage treatment plants, said process comprising the steps of:

mechanically de-watering said aqueous sewage sludge to obtain a wet sludge having a high solids content;

indirectly heating and substantially completely drying said wet sludge in a heated drier, thereby producing in the drier a dried sludge and a water vapor-containing exhaust gas;

conducting said dried sludge from the drier to a solid refuse incinerator for incineration;

conducting said water vapor-containing exhaust gas from the drier through a condenser, whereby the water vapor is condensed and removed from the exhaust gas to produce a substantially dry exhaust gas; and

conducting said substantially dry exhaust gas from the condenser into the combustion chamber of said incinerator, whereby said exhaust gas is deodorized by heating with the aid of the hot combustion gases in the incinerator.

5. An apparatus for the incineration of aqueous sewage sludge such as from community sewage treatment plants, said apparatus comprising a mechanical de-watering means for de-watering aqueous sewage sludge and converting it to a wet sludge having a high solids content, said de-watering means having a sludge inlet and outlet, an indirect drier means for substantially completely drying the wet sludge produced in said de-watering means, said drier means having a sludge inlet and outlet and an outlet for the water vapor-containing exhaust gas produced in said drier means, conduit means coupled between said sludge outlet of said de-watering means and said sludge inlet of said drier means, a condenser means for condensing and removing the water vapor from the exhaust gas produced in said drier means, said condenser means having an exhaust gas inlet and outlet, conduit means coupled between said exhaust gas outlet of said drier means and said exhaust gas inlet of said condenser means, a combustion chamber means for the incinceration of the dried sludge produced in said drier means, said combustion chamber means having a charging shaft and an exhaust gas inlet, conduit means coupled between said sludge outlet of said drier means and said charging shaft of said combustion chamber means for charging said combustion chamber with dried sludge, and conduit means coupled between said exhaust gas outlet of said condenser means and said exhaust gas inlet of said combustion chamber means whereby said exhaust gas is deodorized by heating with the aid of the hot combustion gases in said combustion chamber.

3,954,070

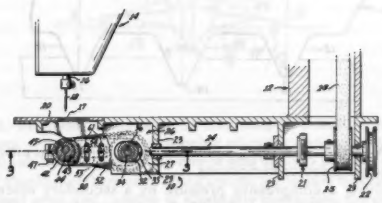
ADJUSTABLE LOOP TAKER SUPPORT FOR SEWING MACHINES

Reinhold Papajewski, Buchig, Germany, assignor to The Singer Company, New York, N.Y.

Filed May 28, 1975, Ser. No. 581,599

Int. Cl.² D05B *57/14*

U.S. Cl. 112—182 **5 Claims**



1. In a sewing machine having a bed and a bracket arm overhanging said bed, a reciprocating thread carrying needle arranged in said bracket arm, and a circularly moving loop taker arranged in said bed for cooperation with said needle in the formation of stitches, a mechanism for supporting and driving circularly moving loop takers of various diameters, said mechanism comprising: a support bracket having an elongated body with a circular hub at the first extremity and a second hub at the opposite extremity of said support bracket, means in said bed for sustaining said support bracket with capacity for angular adjustment thereof about the axis of the circular hub at the first extremity, a drive shaft journalled coaxially in said first hub, actuating mechanism carried in said sewing machine having operative connections for reciprocating said needle and operative driving connections to said drive shaft, a loop taker accommodating shaft journalled in said second hub of said support bracket, said loop taker accommodating shaft being substantially parallel to said drive shaft, means drivingly connecting said loop taker accommodatng shaft and said drive shaft on said support bracket, and means for clamping said support bracket to said bed in selected angular position of adjustment about the axis of the circular hub at the first extremity thereof so as to accommodate circularly moving loop takers of various diameters on said loop taker accommodating shaft.

3,954,071

SEWING MACHINE HAVING TOP AND BOTTOM FEED SYNCHRONIZING MEANS

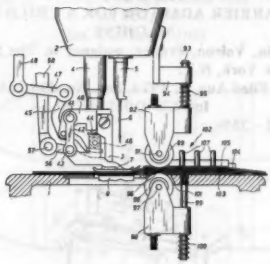
Günther Mall, Kaiserslautern, and Erich Willenbacher, Karlsruhe, both of Germany, assignors to Firma Pfaff Industriemaschinen GmbH, Germany

Filed Dec. 4, 1974, Ser. No. 529,539

Claims priority, application Germany, Dec. 10, 1973, 2361375

Int. Cl.² D05B *27/06*

U.S. Cl. 112—207 **6 Claims**



1. A sewing machine for sewing two material layers to each other in aligned positions, comprising top feed means for feeding a top layer of material, bottom feed means for feeding a bottom layer of material, synchronizing means connected between said top feed means and said bottom feed means for regulating the speed of said top feed means in respect to said bottom feed means, and continuously operable measuring means engageable with the material being fed adjacent the portion being sewed together and continuously producing measuring pulses and being connected to said synchronizing means to deliver the measuring pulses to said synchronizing means to cause it to vary the relative speed of said top and bottom feed means in accordance with the feed of said material layers.

3,954,072

NEEDLES FOR TUFTING OR THE LIKE

Josef Zocher, Harren, Aachen, Germany, assignor to The Singer Company, New York, N.Y.

Filed May 28, 1975, Ser. No. 581,598

Int. Cl.² D05B *85/00*

U.S. Cl. 112—222 **7 Claims**

1. A needle for tufting or the like including a shank having a longitudinal axis, a blade extending from said shank, an eye and point portion including a transverse eye connected to said blade and terminating in a tip, said blade having a longitudinal groove on one side terminating at the eye, said eye and point portion having an axis parallel to and offset relative to said

longitudinal axis away from said groove side, and means defining a shoulder at the junction of the eye and point portion with

the blade on the side toward which the axis is offset to define a clearance above the eye.

3,954,073

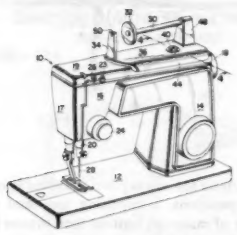
SPOOL CARRIER ADAPTOR FOR A CHILD'S SEWING MACHINE

Claude Varin, Voiron, France, assignor to The Singer Company, New York, N.Y.

Filed Aug. 2, 1974, Ser. No. 494,266

Int. Cl.² D05B *43/00*

U.S. Cl. 112—259 **1 Claim**



1. An adaptor device for converting a sewing machine having an overall appearance, a major portion of which is contributed to by the shape of the sewing machine frame bracket arm, to an overall appearance of a different shape; said sewing machine bracket arm including front and rear sidewalls and a top cover having an exposed contour non-planar surface plating into said sidewalls, said adaptor device adapted to be mounted on top of said bracket arm top cover and having a bracket arm engaging surface complemental to the non-planar contour of the exposed surface of the bracket arm top cover and including at least one depending edge, including a single screw for securing said adaptor device on said bracket arm and cooperating with said bracket arm engaging surface of the adaptor device to lock it in fixed position on said bracket arm; a pedestal provided on said adaptor device and having secured thereto a spool pin; thread spool retaining means on said spool pin; and a thread guide mounted on said adaptor device and disposed in substantial alignment with the axis of the spool pin and in spaced relation to said single securing screw so that lateral forces applied to the thread guide will impart turning moments in said adaptor device about the axis defined by said single securing screw, said single screw being located on said adaptor device opposite a point intermediate the ends of said at least one depending edge so that turning movement of the adaptor device about the fastening screw in either direction will be opposed by said at least one depending edge.

3,954,074

TEXTILE

Arno Edgar Wildeman, Aurel House, Blueberry Road, Bowdon, Altrincham, Cheshire, England

Filed May 16, 1974, Ser. No. 470,650

Claims priority, application United Kingdom, July 26, 1973, 35639/73

Int. Cl.² D05B *93/00*

U.S. Cl. 112—402 **14 Claims**

1. A heat transfer printed textile fabric comprising:

a backing material unsuitable for heat transfer printing; and

a surface material that can be heat transfer printed, said fabric being heat transfer printed on said surface material and said backing material being substantially unaffected by the heat transfer printing.

3,954,075

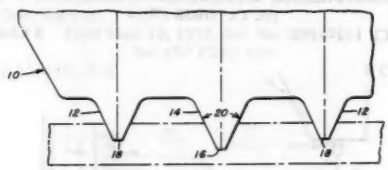
EASY-OPEN CONTAINER WALL AND APPARATUS AND METHOD FOR PRODUCING IMPROVED CONTAINER WALL

Charles L. Jordan, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 14, 1974, Ser. No. 451,191

Int. Cl.² B21D *51/26*

U.S. Cl. 113—121 C **5 Claims**



1. A method of scoring a metallic container wall to provide a removable sector comprising

applying a compressive pressure by a secondary indenter which is disposed outboard of and substantially coextensive with a primary indenter and said secondary indenter's centerline is spaced no more than about 0.025 inch from the centerline of said primary indenter to form an antifracture indentation before an indenter establishing said primary indenter has penetrated to about 50% of its ultimate penetration and effecting positive ultimate penetration by said secondary indenter to no more than about 75% of the ultimate penetration of said primary indenter.

3,954,076

REINFORCING PATCH FOR SAILS AND METHOD OF MAKING SAME

Edward P. Fracker, 356 Cornwall, Rocky River, Ohio 44116

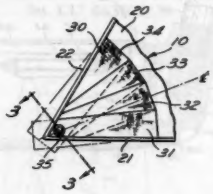
Filed Mar. 3, 1975, Ser. No. 554,443

Int. Cl.² B63H *9/06*

U.S. Cl. 114—103 **10 Claims**

1. A reinforcement for the corner of a sail fabricated from a plurality of substantially rectangular patch panels attached in an overlying position to each other and the sail adjacent the

point of maximum strain at the reinforced corner thereof, said patch panels fanning outwardly from each other from said point so that, for at least the majority of the length of each panel, it overlaps an adjacent panel, the edges of said fanned



out patch panels within the corner of the sail being sewn to said sail and the outwardly fanned-out ends thereof being substantially contiguous to form substantially successive chords of an arc substantially centered at said point.

3,954,077

TRIMARANS

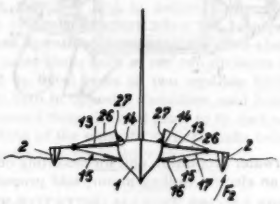
Michel Gaston Jean Piat-Marchand, 28, rue de Lagny, 77 Dampmart, France

Filed May 12, 1972, Ser. No. 252,870

Claims priority, application France, May 14, 1971, 71.17517; Mar. 10, 1972, 72.08382

Int. Cl.² B63B *43/14*

U.S. Cl. 114—123 **3 Claims**



1. Trimaran comprising in combination a hull, a pair of floats, a pair of arms each being pivotally connected to said hull and fixedly attached to one of said floats, a pair of extensible elastic members each being connected to said hull and one of said arms and capable of elastically restraining the upward movement of its corresponding float, and a plurality of flexible and non-extensible members each connecting one of said arms to said hull and capable of restraining said arm from pivoting downwardly.

3,954,078

METHOD OF CONNECTING ADJACENT UNITS OF A BARGE TOW

Emilio C. Garcia, 441 Gravier St., New Orleans, La. 70130

Filed Feb. 21, 1974, Ser. No. 444,586

Int. Cl.² B63B *21/00*

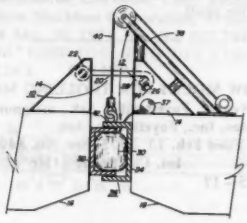
U.S. Cl. 114—235 R **4 Claims**

1. Method of connecting spaced-apart adjacent ends of units of a marine tow comprising the steps of:

a. engaging spaced-apart adjacent ends of units with loosely-engaging rigid connecting means;

b. inserting deflated cushions between said unit ends; and

c. inflating said deflated cushions to expand and preload said rigid connecting means beyond anticipated tow loads plus an additional factor of safety load for precluding all relative movement between said connecting means and



said units and the separation thereof until preloading is released by deflation.

3,954,079

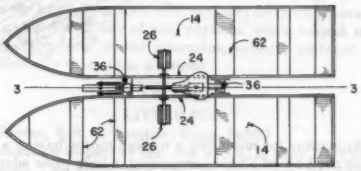
DUAL HULL WATER BICYCLE

Mohammed S. Gof, 89 Haldon Ave., Paterson, N.J. 07522

Continuation-in-part of Ser. No. 420,101, Nov. 29, 1973, abandoned, which is a division of Ser. No. 148,526, June 1, 1971, Pat. No. 3,791,332. This application Mar. 10, 1975, Ser. No. 557,158

Int. Cl.² B60F *3/00*

U.S. Cl. 115—2 **1 Claim**



1. A dual hull water bicycle for use over land and water comprising in combination:

two boat hulls each formed by a bottom having a continuous upwardly extending sidewall therearound;

said hulls having a converging bow and a substantially square stern;

said bottoms extending upwardly at their bows and sterns;

a bicycle frame member centrally disposed between two of said hulls;

supporting means to secure said bicycle frame to and between said hulls;

steering means carried by said bicycle frame between the bow ends of said hulls;

a wheel operatively connected to said steering means and positioned below and between the forward exterior portions of the bows of said hulls;

a drive shaft extending laterally of, below and rotatably carried by the exterior of each of said hulls adjacent their sterns;

a bicycle sprocket on said frame member;

a bicycle pedal within each hull and connected operably with said bicycle sprocket on said frame member;

a second sprocket on said drive shaft;

an endless chain carried by said sprockets;

axle shafts in communication with said drive shaft and extending laterally therefrom such that one axle shaft extends under each of said hulls;

said axle shafts capable of being engaged with and disengaged from said drive shaft;

a wheel mounted on each of said axle shafts;

a bevel gear mounted on said drive shaft;

a propeller shaft extending rearward from said drive shaft and having a bevel gear on its forward end;

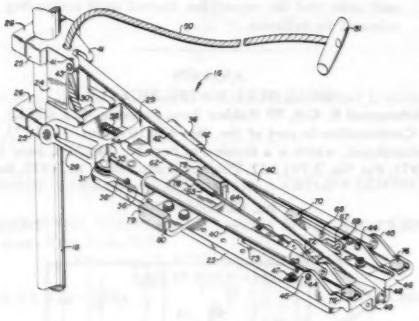
said propeller shaft being secured between each of said hulls by mounting brackets which permit a slight movement of said propeller shaft such that its bevel gear may be engaged with and disengaged from said bevel gear on said drive shaft.

3,954,080

BOW MOUNT FOR TROLLING MOTORS

Lester C. Weaver, Fayetteville, Ark., assignor to Shakespeare of Arkansas, Inc., Fayetteville, Ark.

Filed Feb. 13, 1975, Ser. No. 549,790
Int. Cl.[2] B63H 21/26
U.S. Cl. 115—17 **10 Claims**



1. Apparatus for mounting a trolling motor having a motor tube on the bow of a boat comprising, a base plate adapted to be secured to the boat deck adjacent the bow, a mounting bracket for clamping said motor tube, a linkage pivotally connected between said base plate and said mounting bracket for swinging said motor tube from a substantially vertical operating position in front of said base plate to a horizontal stowed position overlying said base plate, means for detachably securing said linkage to said base plate in said operating position, said linkage including a support member for resting on said base plate in said operating position and said securing means including a latch pin on the base plate projecting through said support member, a latch plate on said support member detachably engaging said latch pin, and movable means on said support member to release said latch plate.

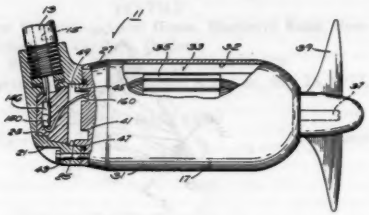
3,954,081

OUTBOARD MOTOR WITH SPEED REGULATOR FOR DC PERMANENT MAGNET MOTOR

Charles H. Blake, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 399,609, Sept. 21, 1973, abandoned. This application Feb. 14, 1975, Ser. No. 549,951
Int. Cl.[2] B63H 21/26
U.S. Cl. 115—18 E **22 Claims**

1. An outboard motor comprising a shaft extending vertically under normal operating conditions and adapted to be connected to a boat hull, said shaft including a hollow interior, a lower housing fixedly connected to said shaft and including a hollow interior communicating with said hollow interior of said shaft, an electric motor mounted in said housing hollow interior and including an output shaft including a first and extending exteriorly of said lower housing and a second end terminating within said hollow interior of said lower housing, a propeller mounted on said first end of said output shaft, a transistor electrically connected to said motor and located in said housing hollow interior in axially spaced relation from



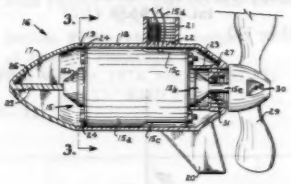
said output shaft, and a thermally conductive means fixedly bonding said transistor to said housing.

3,954,082

MOTOR HOUSING FOR AN ELECTRIC TROLLING MOTOR

William G. Roller, Purdy, Mo., and Emery L. West, Oklahoma City, Okla., assignors to William G. Roller, Purdy, Mo.

Continuation of Ser. No. 393,779, Sept. 4, 1973, abandoned. This application Nov. 22, 1974, Ser. No. 526,234
Int. Cl.[2] B63H 21/26; H02K 5/12
U.S. Cl. 115—18 E **2 Claims**



1. An underwater propulsion unit for mounting on an elongate shaft of an electric trolling motor, said propulsion unit comprising:

an unsealed electric motor having a water pervious casing which includes a cylindrical shell fitted with an end closure at each end thereof, a rotatable work shaft projecting through one said end closure, and electrical leads disposed through said casing and insertable through said elongate shaft and connectable to a voltage source for powering the motor;

a water impervious housing mounted on the end of said elongate shaft by a watertight connection, said housing encapsulating said casing of said unsealed electric motor and having a circular opening through which said work shaft projects, said housing being a two piece sealed construction with an internal diameter substantially equal to the diameter of said motor casing and with internal buttressing surfaces snugly engaging the end closures of said motor casing to eliminate vibrations and play of the motor within the housing;

a curable sealing agent bonding said motor casing to the interior of said housing to further eliminate vibrational movement of said motor casing relative to said housing;

a resiliently flexible bearing member encircling said work shaft and forming a watertight seal with said housing, said member including a flexure collar encircling said work shaft to prevent the passage of water at the contact interface while permitting rotation of the work shaft; and

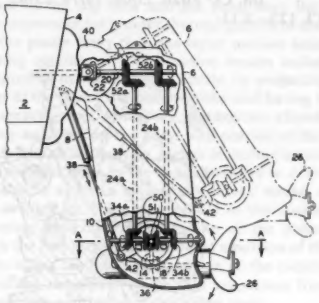
a propeller member mounted on the end of said work shaft projecting from said housing.

3,954,083

TWIN-PROPELLER STERN DRIVE

James K. Frostrom, Mount Juliet, Tenn., assignor to The Mocaire Company, Mount Juliet, Tenn.

Continuation-in-part of Ser. No. 418,588, Nov. 23, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,201
Int. Cl.² B63H 5/10
U.S. Cl. 115—37 3 Claims



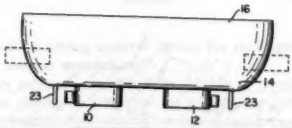
1. A twin-propeller stern drive comprising twin propellers adapted to rotate in opposite directions, said propellers connected by means of a cross-shaft to at least one vertical shaft by means of gears, said at least one vertical shaft being adapted for joining to a single horizontal drive, said shafts and gears being contained within a housing therefor, one of said propellers being on one side of said at least one vertical shaft and the other on the opposite side, said shaft with propellers connected thereto being positioned so as to operate normally below the waterline and to automatically maintain thrust alignment of said propellers when the twin-propeller stern drive moves upward or downward, the cross-shaft comprising a divided cross-shaft, each of the two divisions thereof being connected by bevel gears to two separate horizontal shafts adapted to turn in opposite directions, said horizontal shafts each connected through bevel gears to its own separate vertical shaft, both of the separate vertical shafts being connected by bevel gears to a single drive shaft.

3,954,084

COUNTER-ROTATING MARINE PROPULSION SYSTEM

Francis J. Cronin, 34 Jackson Ave., Wayne, N.J. 07470

Filed Dec. 23, 1974, Ser. No. 535,970
Int. Cl.² B63H 1/04
U.S. Cl. 115—50 10 Claims



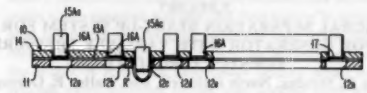
1. A counter-rotating marine propulsion system comprising:
a. two-symmetrical spinwheel assemblies, said assemblies horizontally disposed with respect to the bottom of a boat and actuated by a mechanical power supply means;
b. a cam axially disposed within each of said spinwheels; and
c. a plurality of drive blades disposed in reciprocating relationship to said cam such that the extension and retraction of said blades can be controlled through selective transmissional changes in an otherwise fixed position of said cam and further in which said spinwheel will rotate about the same axis upon which said cam is secured, thereby causing the selective extension of said blades in response to the motion of said spinwheel past a particular bearing surface of said cam.

3,954,085

SELF-RESTORING CHANGEABLE EXHIBITOR/KEYBOARD

Ernie George Nassimbene, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1974, Ser. No. 502,704
Int. Cl.² G08B 5/20; H01H 9/16, 17/00
U.S. Cl. 116—124 L 13 Claims



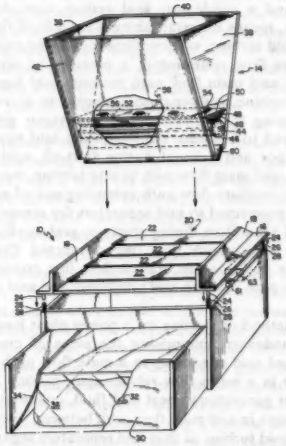
1. A self-restoring changeable exhibitor structure comprising:
a base means having a plurality of apertures aligned therein between the ends thereof;
a flexible strip affixed adjacent its ends to said base means and overlying all of said apertures;
said flexible strip having an unfixed length greater than the distance between the remote ends of the farthest spaced apertures in said base means to cause one portion of said strip normally to be looped into one of said apertures,
said one portion being adapted to be withdrawn from said one aperture concurrently with and incident to the looping of another portion of said strip into another of said apertures,
said strip having portions with optically different characteristics such that any of said portions, while looped into a respective one of the apertures, reflects ambient light differently than other portions.

3,954,086

LITTER BOX

Fred Maness, R.R. 1, Basehor, Kans. 66007

Continuation-in-part of Ser. No. 473,912, May 28, 1974, abandoned. This application Jan. 20, 1975, Ser. No. 542,119
Int. Cl.² A01K 29/00
U.S. Cl. 119—1 10 Claims



1. A litter box comprising:
a hollow cabinet;
means mounted to said cabinet for dispensing litter onto the top of said cabinet;
shutter means forming a portion of the top of said cabinet for supporting an animal, excretions of said animal and said litter;

means resiliently mounting said top of said cabinet to said cabinet to allow movement of said top in response to the mounting and dismounting of said animal;

sensor means for detecting position of said top; and

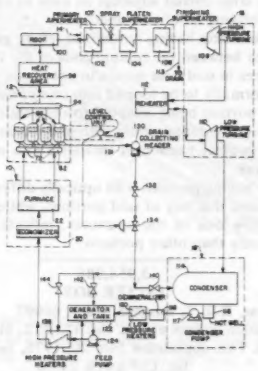
drive means responsive to said sensor means for causing said shutter means to open and to transfer said excretions and litter into said cabinet.

3,954,087

INTEGRAL SEPARATION START-UP SYSTEM FOR A VAPOR GENERATOR WITH VARIABLE PRESSURE FURNACE CIRCUITRY

William D. Stevens, North Caldwell, and Walter P. Gorzegno, Morristown, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Dec. 16, 1974, Ser. No. 533,389
Int. Cl.² F22B 29/12
U.S. Cl. 122—406 S 8 Claims



1. A start-up system for use in a power plant having a steam turbine and a condenser, said system comprising a vapor generator, means for establishing a main fluid flow path connecting said turbine, said condenser and said vapor generator in a series flow relationship, a plurality of separators connected in said main flow path between said vapor generator and said turbine, said separators adapted to accommodate the full operating load conditions of said vapor generator after start-up and to separate the fluid from said vapor generator into a vapor and a liquid during start-up, said vapor being passed in said main flow path to said turbine, means for establishing an auxiliary flow path extending out of said main flow path and connected to said separators for receiving the liquid from said separators during start-up, said auxiliary flow path including one branch flow line connected directly to said condenser and another branch flow line connected to said main flow path between said condenser and said vapor generator.

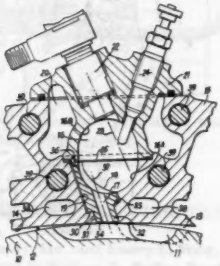
5. A method of starting up a power plant having a turbine and a condenser, comprising the steps of connecting said turbine and said condenser in a main flow path with a vapor generator in a series flow relationship, passing fluid through said vapor generator to heat said fluid, connecting a plurality of separators in said main flow path between said vapor generator and said turbine so that said separators separate said fluid into a vapor and liquid during start-up and accommodate the full operating load conditions of said vapor generator after start-up, passing the vapor from said separators in said main flow path to said turbine, and selectively passing the liquid from said separators out of said main flow path directly to said condenser or back to said main flow path between said condenser and said vapor generator.

3,954,088

COMBUSTION CHAMBER ARRANGEMENTS FOR ROTARY COMPRESSION-IGNITION ENGINES

William Murray Scott, Brighton, England, assignor to Rolls-Royce Motors Limited, Cheshire, England

Filed Oct. 1, 1974, Ser. No. 511,479
Claims priority, application United Kingdom, Oct. 9, 1973, 47176/73
Int. Cl.² F02B 53/04, 19/14, 23/02
U.S. Cl. 123—8.11 16 Claims



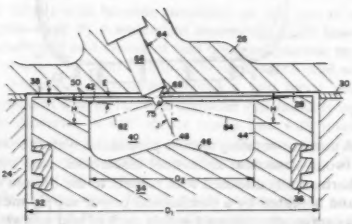
1. A rotary piston compression-ignition internal combustion engine comprising a housing defining a main chamber comprising n lobes and a subsidiary chamber, the lower part of which is formed by a shaped recess, which serves as a primary ignition chamber and which communicates with the main chamber via a bore in the housing wall leading from the recess to the chamber, a shaft extending axially of the housing, an $(n + 1)$ sided piston eccentrically mounted on the shaft and rotatable in the housing, a seal mounted at each apex formed between each pair of adjacent sides of the piston, means for injecting fuel into the primary ignition chamber, a tubular insert of a refractory material fitted into the bore and stopping short of the internal surface of the main chamber and means positively locating the insert in the bore for preventing the insert from expanding into the main chamber during operation of the engine.

3,954,089

DIESEL ENGINE

Lee Roy Hardesty, and James Alfred Sharpsteen, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed July 16, 1971, Ser. No. 163,377
Int. Cl.² F02B 3/00
U.S. Cl. 123—30 C 4 Claims



1. In a diesel engine having a cylinder, a piston, and a head, the improvement comprising: a combustion chamber in the piston including a generally cylindrical outer wall portion, the diameter of the piston being between 1.4 and 1.85 times the diameter of the combustion chamber, said piston reciprocating in a cylinder and having less than 0.020 inch clearance

from the head at the top of the piston stroke under full load operating conditions, providing a compression ratio between 14 and 17 to 1, said piston having an annular tapered area adjacent to and surrounding the combustion chamber opening on the top face under static conditions, the tapered area being inclined upwardly and outwardly at an angle of less than 1° relative to the plane normal to the cylinder axis under static conditions to provide a greater static clearance between the inner portion of the top face and the head than the outer portion to compensate for greater thermal growth of the inner portion of the piston body than the outer portion under full load operating conditions; fuel injection means including a nozzle mounted in the head with a nozzle tip projecting into the chamber at the top of the piston stroke and having orifice means for spraying fuel within the combustion chamber so that the spray impinges on the outer wall portion of the combustion chamber; an air delivery means including an air inlet port and an air inlet valve in the head operative to deliver air in the cylinder in a vortex during the intake stroke of the piston, the swirling air being accelerated in the combustion chamber during the compression stroke of the piston and reacting with the fuel spray therein so that a portion of the fuel burns before it hits the outer wall portion of the combustion chamber and the remainder of the fuel evaporates from the upper wall portion and burns in the vapor state.

3,954,090

IGNITION TIMING CONTROL DEVICES FOR ENGINES

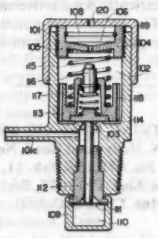
Nobuyoshi Ota, Kariya; Hiroyuki Masuda, Aichi, and Kiyohiko Mizuno, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 2, 1973, Ser. No. 402,777

Claims priority, application Japan, Oct. 3, 1972, 47-11530[U]; Nov. 17, 1972, 47-133003[U]; Jan. 18, 1973, 48-8942[U]; Jan. 18, 1973, 48-8943[U]; Aug. 24, 1973, 48-95406

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 A **6 Claims**



1. An ignition timing control device for an engine having a carburetor therein comprising:

a vacuum advance mechanism capable of controlling the ignition timing in response to a negative pressure in a carburetor,

a negative pressure line communicating between said vacuum advance mechanism and said carburetor, and

a thermostatic valve means for communicating said negative pressure line with the surrounding atmosphere only when the engine temperature is within a predetermined temperature range between a lower setting point and a higher setting point, said thermostatic valve including a valve casing having a valve bore, a chamber axially aligned with said bore and in constant communicating relationship with said negative pressure line, a first port provided coaxially on one end of said bore for intercommunicating said bore and said chamber and a second port provided coaxially on the other end of said bore and in constant communicating relationship with the surrounding atmosphere, a main valve element movably disposed in said bore with a substantial clearance therebetween, a first spring for urging said main valve element toward said first port, a second valve element coaxially and movably mounted on said main valve element, a second spring for urging said second valve element to a position projecting from said main valve element toward said second port, a temperature detector, and a piston rod extending from said detector through said chamber and said first port with a substantial clearance therebetween for moving said main valve element against said first spring in response to said temperature detector, wherein said main valve element closes said first port when the temperature of cooling water is less than said lower setting point and said second valve element closes said second port when the temperature of said cooling water is in excess of said higher setting point.

3,954,091

SYSTEM FOR DETOXICATING EXHAUST GASES

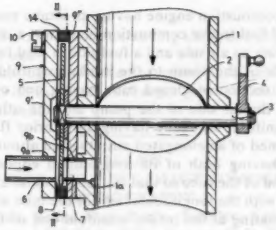
Gerhard Stumpp, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed June 4, 1973, Ser. No. 366,260

Claims priority, application Germany, Aug. 25, 1972, 2241935

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **1 Claim**



1. In a system for detoxicating exhaust gases in an internal combustion engine, having air intake pipe means and conduit means having a central longitudinal axis for recycling a part of the exhaust gases of said engine into said air intake pipe means, the improvement comprising, in combination, valve means including a movable valve member for controlling the flow of said part of the exhaust gases being thus recycled, throttle means comprising a flap, a housing for said valve means, said housing being mounted directly to said air intake pipe means and having an opening for receiving said conduit means therein, and a shaft on which both the flap and the movable valve member are mounted for common rotation therewith, said movable valve member being thus controlled in dependence on the adjustment of the throttle flap, said flap being mounted within said air intake pipe means and said movable valve member being mounted within said housing in a plane which is perpendicular to the central longitudinal axis of the conduit means, wherein said intake pipe means includes an opening through which the recycled exhaust gases flow into said intake pipe means, wherein said movable valve member controls the flow of said part of the exhaust gases being thus recycled by controlling the extent of both said openings utilizing a marginal portion thereof, and wherein said movable valve member comprises a disc having a central axis coincident with the axis of rotation defined by said shaft and being adapted for rotation about said axis in a plane at an angle with said conduit means, said marginal portion being profiled as a cam and said conduit means comprises an interrupted wall zone within which a transverse wall zone is defined through which said marginal disc portion passes while in engagement with the transverse wall zone, whereby the cross-sectional area of said conduit means is varied in dependence on said

cam and upon rotational adjustment of the position of said disc.

3,954,092

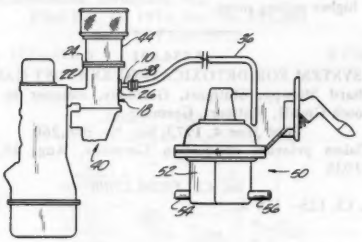
FEED TUBE FLAME ARRESTER

Mardy Polaner, Birmingham, Mich., assignor to Barbron Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 387,906, Aug. 3, 1973, Pat. No. 3,889,649, which is a division of Ser. No. 177,235, Sept. 2, 1971, abandoned. This application Apr. 28, 1975, Ser. No. 572,283

Int. Cl.² F02M *17/00, 25/06, 29/00*

U.S. Cl. 123—142 **3 Claims**



1. In a combustion engine having an intake manifold for the passage of fuel to the combustion chamber, a diaphragm fuel pump having an air side and a fuel side, a feed line connecting the air side of the pump to the intake manifold including an elongated section of closed tube having one open end connected to the air side of the pump and the other end to the intake manifold, said tube having an interior flame arresting baffle formed of an elongated strip twisted about its elongated axis and having both of its longitudinal edges fixed to the interior end of the tube so that the longitudinal axis of the strip coincides with the longitudinal axis of the tube and having one end terminating at the intake manifold end of the tube.

3,954,093

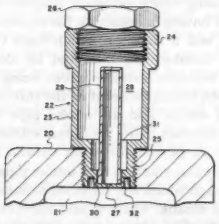
IGNITION DEVICE FOR ENGINES

James C. Hughes, 172 Poinsetta Circle, Terrell, Tex. 75160

Filed May 21, 1973, Ser. No. 362,108

Int. Cl.² F02P *23/00*

U.S. Cl. 123—143 A **9 Claims**



1. An ignition device for use in an internal combustion engine of the kind having a combustion chamber in which successive charges of a fuel-air mixture are introduced and are compressed, ignited, expanded, and exhausted, and including means for cooling a wall of the combustion chamber, said device comprising:

an elongated ignition cell having a base adapted to be mounted in the cooled wall of the combustion chamber, said cell having a length to diameter ratio above 5:1, and having an orifice formed in said base for providing communication between the interior of said cell and the interior of the combustion chamber, said orifice diameter being at least 0.23 the diameter of said cell;

mounting means for securing said cell in the cooled wall of the combustion chamber, including means blocking flow of heat between said base of said cell and the cooled wall of the combustion chamber, said blocking means including a circular groove in said base surrounding said orifice and spaced therefrom;

and means surrounding said cell for controlling flow of heat between said cell and the ambient.

3,954,094

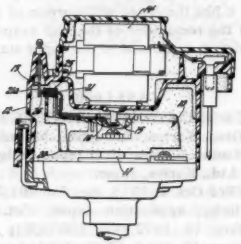
IGNITION DISTRIBUTOR ROTOR

Charles H. Huebner, Royal Oak, and Allen G. Schroeder, Livonia, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1974, Ser. No. 526,627

Int. Cl.² H01H *19/12*

U.S. Cl. 123—146.5 A **5 Claims**



1. An ignition distributor rotor of the automotive type comprising: a body member of an electrically non-conductive material; a distributor movable output electrode having an output tip supported by said body member, said output electrode being of an electrically conductive material; and a thermal shield member of an electrically non-conductive material completely surrounding and spaced from at least a portion of said output electrode.

3,954,095

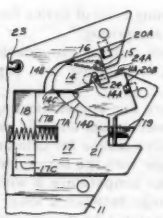
BOW STRING RELEASE DEVICE

Kenneth Don Lewis, N. Hollywood Road, Nekoosa, Wis. 54457

Continuation of Ser. No. 441,156, Feb. 11, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,269

Int. Cl.² F41C *5/00*

U.S. Cl. 124—35 A **6 Claims**



1. A release device for a bow string, which is holdable in the hand of an archer, comprising:

a. a hand grip member having a slot therein for receiving a bow string;

b. bow string latch means rotatably mounted to said hand grip member for engaging a bow string inserted into said slot when said latch means is in an open position, and for

rotating to a closed position when in engagement with a bow string to securely hold a bow string in said slot;

c. trigger means slidably movable in its entirety along a straight line within said hand grip member for holding said latch means in its closed position, and for sliding rearwardly within said hand grip member when pressed by a finger of an archer to release said latch means and allow said latch means to rotate to its open position and release a bow string.

3,954,096
METHOD OF WORKING, FORMING AND FINISHING SINGLE CRYSTALS

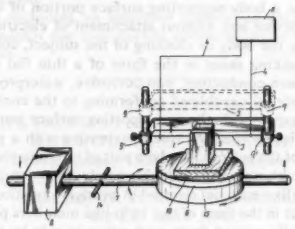
Cestmir Barta, Prague; Oldrich Liska, Decin; Jaroslav Louda, Usti nad Labem; Emil Ryttnauer, Uncin, and Jan Zemlicka, Prague, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Dec. 3, 1973, Ser. No. 421,074

Claims priority, application Czechoslovakia, Dec. 2, 1972, 8231-72

Int. Cl.² B28D *1/00*

U.S. Cl. 125—1 **6 Claims**



1. The method of working a single crystal which sublimates, comprising acting upon the single crystal by a heated instrument the temperature of which is at least the same as the temperature at which the single crystal sublimates, converting the portion of the crystal in the zone thereof in contact with the instrument directly into gas, and permitting the escape of such gas from said zone.

3,954,097
SOLAR HEAT COLLECTOR

Leon T. Wilson, Jr., Glastonbury, Conn., assignor to Wilson Solar Kinetics, Hartford, Conn.

Filed Sept. 16, 1974, Ser. No. 506,551

Int. Cl.² F24J *3/02*

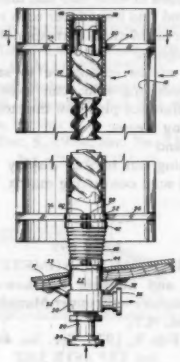
U.S. Cl. 126—271 **6 Claims**

1. A solar heat collector for heating water or other fluid heat exchange mediums, said collector comprising:

an elongated heat exchanger providing two fluid flow paths each extending substantially the full length of said exchanger, said exchanger including means serially connecting said two flow paths at one end of said exchanger so that fluid introduced at one end of said exchanger to one of said flow paths first traverses the length of said exchanger by flowing along one of said flow paths in one direction and then traverses the length of said exchanger by flowing through the other of said flow paths in the opposite direction, said flow paths being defined by two coaxially positioned, thin walled tubes, having internal passageways, one of the tubes being helically corrugated along a substantial portion of its length whereby one of said flow paths includes an elongated passageway coaxially within the two tubes and the other of said flow paths includes at least one helical passageway circulating around said elongated passageway;

a heat trapping annular shield of optically transparent material surrounding said heat exchanger and extending along a major portion of its length;

an elongated reflector having an elongated and generally parabolic reflecting surface which focuses incident solar



energy onto a focal line extending along the length of said reflector; and

means mounting said reflector relative to said heat exchanger with said heat exchanger generally colinear with said focal line.

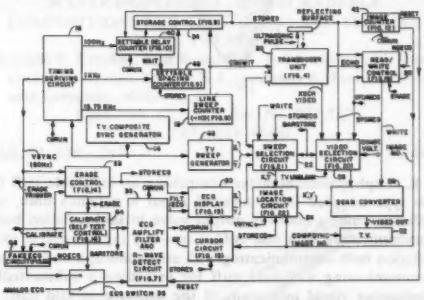
3,954,098
SYNCHRONIZED MULTIPLE IMAGE TOMOGRAPHIC CARDIOGRAPHY

Donald E. Dick, Salina Star Route, Boulder, Colo. 80302; Daniel Cooper, 1320 Wabash St., Denver, Colo. 80220, and Ronald E. Hileman, 2680 Stephens, Boulder, Colo. 80303

Filed Jan. 31, 1975, Ser. No. 546,043

Int. Cl.² A61B *10/00*

U.S. Cl. 128—2.05 Z **23 Claims**



1. A synchronized cardiac tomographic imaging system, comprising:

a positionable transducer means producing scan sweeps and transducer video together representing the location of cardiac structures along the axis of the transducer;

means responsive to a beating heart for producing a repeating sync pulse indicative of the same functional point in each successive heart cycle;

an image timing circuit including first means to establish a delay interval between said sync pulse and a first image and second means to establish a spacing interval between each successive image;

control means responsive to said image timing circuit for generating a storage signal corresponding to the preestablished time of each image;

image counter means to count the number of storage signals issued since the sync pulse;

scan converting means having a storage matrix;

means responsive to said storage signal for causing said scan converting means to write into said matrix with said transducer video and said transducer scan sweeps for a predetermined interval of time corresponding to each one of said storage signals;

image location means responsive to said image counter means for modifying said scan sweeps to locate each image in a difference place on the storage matrix of said scan converting means;

display means; and

means for reading out to said display means the images stored in said scan converting matrix.

3,954,099

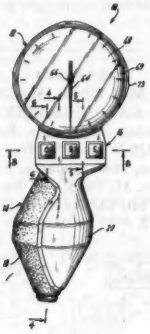
SPHYGMOMANOMETER

Jan Raczkowski, and Stefania Raczkowski, both of Long Beach, N.Y., assignors to Propper Manufacturing Company, Inc., Long Island, N.Y.

Filed Feb. 8, 1974, Ser. No. 440,652

Int. Cl.² A61B 5/02

U.S. Cl. 128—2.05 G 7 Claims



1. A sphygmomanometer comprising an inflatable cuff of the type adapted to be secured about a patient's limb, an inflation bulb, a one-way output valve in said inflation bulb communicating with said cuff, a one-way input valve in said inflation bulb communicating with atmosphere, a manometer communicating with said cuff for providing a substantially continuous visual indication of the pressure in said cuff, a manifold communicating with said cuff, said manifold including a plurality of apertures of differing diameters, a plurality of closure elements, means mounting each said closure element adjacent a corresponding one of said apertures, each said closure element being individually movable between a closed position wherein air is prevented from escaping from said aperture and an open position wherein air is released from said aperture, spring means associated with each of said closure elements for retaining said closure element in a normally closed position, and a plurality of control buttons, one associated with each closure element for moving said closure element from said closed position to said open position.

3,954,100

FLEXIBLE SENSOR PAD FOR NON-ATTACHED MONITORING EKG SIGNALS OF HUMAN SUBJECTS

Carl Wilhelm Sem-Jacobsen, Oslo, Norway, assignor to International Defense Consultant Services, Inc., Washington, D.C., a part interest

Filed Dec. 10, 1974, Ser. No. 531,329

Int. Cl.² A61B 5/04

U.S. Cl. 128—2.06 E 10 Claims

1. A flexible sensor pad for continuous biomedical monitoring of electrocardiogram signals from a clothed human subject through the clothing worn by the subject and without direct contact with the skin of the subject while the subject is being supported on a body-supporting surface portion of a subject supporting device and without attachment of electrical leads or sensors to the body or clothing of the subject, comprising a flexible backing sheet in the form of a thin flat panel of electrically non-conducting, non-corrosive, waterproof, flexible sheet material capable of conforming to the contour of a variety of shapes of the body-supporting surface portion and being of a size to span an area coextensive with a predetermined area of the subject's body, a pair of separate electrically conductive pick-up panels of highly conductive, non-corrosive flexible web-like material secured in overlying relation on said backing sheet in the form of two strip-like members physically and electrically spaced from each other in side-by-side relation located wholly within the periphery of said backing sheet to receive electrocardiogram signals from the subject by transmission to the pick-up panels through peripheral perspiration from the subject communicated through the clothing being worn by the subject, the pick-up panels being located to be in good compression pressure relation with a pair of spaced predetermined body areas of the subject, a thin flexible fabric cover of moisture-permeable textile material overlying the pair of pickup panels to be disposed in direct contact with clothing of the subject covering said predetermined body areas and isolated from direct contact with subject's skin in such body areas by said clothing and having sufficient open spaces therethrough to pass peripheral perspiration from the subject to the pick-up panels for transmission to the latter of the electrocardiogram signals, said fabric cover being secured peripherally to the backing sheet and completely covering said pick-up panels so that said pick-up panels are located wholly within the periphery of said fabric cover, and a pair of electrical signal conductors connected respectively in electrically conductive relation to the respective pick-up panels and extending beyond the backing sheet for connection to electrocardiogram signal processing circuitry.

3,954,101

AUDIOTACTILE COMMUNICATION SYSTEM

How F. Wachspress, 1940 Washington St., San Francisco, Calif. 94109

Continuation-in-part of Ser. No. 337,719, March 2, 1973, Pat. No. 3,875,932. This application Apr. 7, 1975, Ser. No. 565,466

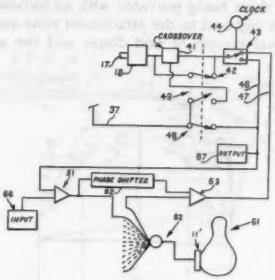
Int. Cl.² A61H 1/00

U.S. Cl. 128—24 R 15 Claims

1. An audiotactile communication system comprising an audiotactile sensor including a transducer producing electrical signals responsive to applied sound waves and means for coupling said transducer to the skin of a life

form for producing electrical signals representing movement of said skin against the sensor.

an audiotactile stimulator including an audiotactile transducer producing sound waves from applied electrical signals and having a sound waveguide extending there-



from with means for coupling same to the skin of a life form, and

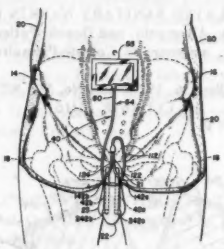
means including an amplifier connecting said sensor and stimulator for audiotactile communication between life forms.

3,954,102

PENILE ERECTION SYSTEM AND METHODS OF IMPLANTING AND USING SAME

Robert E. Buuck, Golden Valley, Minn., assignor to American Medical Systems, Inc., Minneapolis, Minn.

Filed July 19, 1974, Ser. No. 490,083
Int. Cl.² A61F *5/00*
U.S. Cl. 128—79 **8 Claims**



1. An erectile system for implanting in a male afflicted with erectile impotence, said system comprising:

a first inflatable cylinder for positioning within a first corpora cavernosa region within the male's penis, said first cylinder adapted to expand circumferentially and longitudinally in response to inflation thereof;

a second inflatable cylinder for positioning within a second corpora cavernosa region within the male's penis, said second cylinder adapted to expand circumferentially and longitudinally in response to inflation thereof;

fluid transfer means for inflating said first and second cylinders by directing fluid thereinto in a first direction to produce a penile erection; said fluid transfer means comprising a manually squeezeable elastomeric pump bulb, said pump bulb including a wall portion; and

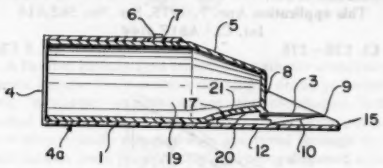
normally closed, manually actuable bypass valve means in fluid flow communication with said first and second inflatable cylinders and normally preventing backflow of fluid out of said cylinders in a second direction opposite to said first direction, said valve means being selectively operable in response to positive actuation to an open position to release fluid from said cylinders in said second direction to thereby deflate said cylinders when it is desired to end said erection, said bypass valve means located interiorly of said pump bulb, and said bypass valve means actuable to said open position by manual displacement of said wall portion of said elastomeric pump bulb.

3,954,103

APPARATUS AND INTRAUTERINE DEVICE FOR THE IMMEDIATE PUERPERIUM FOR THE CONTROL OF HUMAN FERTILITY

Ricardo Garcia-Roel; Ruben Saldaña-Garcia, and Rogelio F. Garcia-Flores, all of Escobedo Sur 733, Suite 201, Monterrey, Nuevo Leon, Mexico

Filed Dec. 9, 1974, Ser. No. 530,847
Int. Cl.² A61F *5/46*
U.S. Cl. 128—130 **4 Claims**



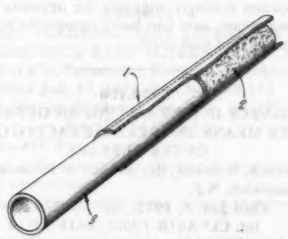
1. Contraceptive intrauterine means for manually inserting a foreign object in the uterine cavity when enlarged after birth, comprising in combination, a cylindrical guide, (sleeve) truncated cylinder means for disposal on a surgeon's finger, guidable within said guide, an assembly including a hook removably held on said truncated cylinder, said guide having a frontal limit to shield the hook from premature engagement with the uterine wall and a tab coupled to said hook comprising said foreign object, and a detent holding said truncated cylinder in place with said hook in shielded position, said truncated cylinder comprising means for displacing by manual force said hook beyond said frontal limit thereby attaching said hook to said uterine wall to deposit said foreign object in said uterine cavity.

3,954,104

WATER-DISPERSIBLE, BIODEGRADABLE COMPOSITIONS AND CONTAINERS AND THE LIKE MADE THEREFROM

Kenneth S. Kraskin, East Brunswick, and Mohamed W. Hammad, Old Bridge, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Filed Nov. 27, 1974, Ser. No. 527,737
Int. Cl.² A61F *15/00*
U.S. Cl. 128—263 **7 Claims**



1. An applicator for tampons and the like comprising:

a. a self-supporting, open-ended tube of a thermoplastic, water-dispersible, biodegradable composition of matter comprising hydroxyalkyl cellulose, starch, and an an-

timycotically-effective amount of a member selected from the group consisting of sorbic acid and its alkali metal salts; and

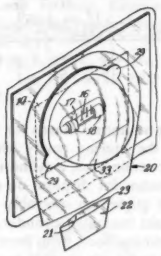
b. a substantially rigid biodegradable plunger moveably received within said tube and adapted to expel a tampon or the like from within said tube, whereby the applicator is completely biodegradable and disposable in a toilet system and yet is resistant to fungal attack prior to disposal.

3,954,105

DRAINAGE SYSTEM FOR INCISIONS OR WOUNDS IN THE BODY OF AN ANIMAL

Harvey M. Nordby, Buffalo Grove; John L. Nolan, Glenview, and Bremen I. Johnson, Cary, all of Ill., assignors to Hollister Incorporated, Chicago, Ill.

Continuation of Ser. No. 402,047, Oct. 1, 1973, abandoned.
This application Apr. 7, 1975, Ser. No. 565,614
Int. Cl.² A61F *5/44*
U.S. Cl. 128—275 **5 Claims**



1. A drainage system for draining fluids from an opening such as a wound or incision in the body of an animal, said system being usable in combination with a drain having a portion within the body and a portion extending outwardly of the body through said opening, said drainage system comprising a sheet of gelatinous material having a size sufficient to cover the wound, the drain, and a substantial portion of the external area of the body surrounding the opening, said sheet having a face adapted to be placed in direct contact with and thereby to sealingly engage the external area of the body surrounding the opening, said sheet being adapted to have an aperture formed therein exposing only said opening and the drain therein while covering and isolating the area of the body surrounding said opening and drain, ring forming means of relatively stiff but deformable plastic material, means for securing one side of the ring forming means in sealing engagement with the opposite face of said sheet surrounding said aperture, and a cap of thin transparent plastic material having an edge portion sealingly engaging the opposite side of said ring forming means, said cap being removable to give access to said opening and said drain.

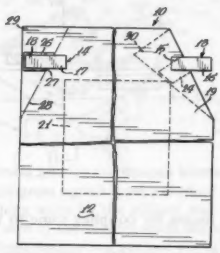
3,954,106

DISPOSABLE DIAPER HAVING AN OFF-SET TAB FASTENER MEANS AND RELEASE FACING ON DIAPER OUTER SURFACE

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 8, 1975, Ser. No. 539,486
Int. Cl.² A41B *13/02*; A61F *13/16*
U.S. Cl. 128—287 **3 Claims**

1. A disposable diaper having an inside surface for direction toward an infant when the diaper is worn by that infant and an outside surface for direction away from said infant and including a thin, flexible backing sheet of substantially moisture-impermeable material, a moisture-retaining layer having a pad of absorbent material superposed on said backing sheet and attached thereto, and a fastening tab means positioned solely on the outside surface of said diaper and comprising a fixed end and a free working end; said fixed end being attached to the backing sheet on the outside surface of said diaper at an attachment zone near a longitudinal margin of said diaper, said backing sheet being provided with an outwardly-facing release region adjacent to the attachment zone and between the longitudinal margin of said diaper and the attachment



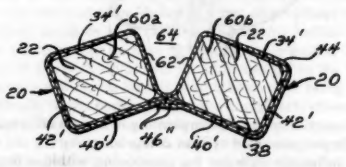
zone, said free working end having a layer of pressure-sensitive adhesive for removable attachment to said release region prior to use, and said outwardly-facing release region having a boundary adjacent to said attachment zone which boundary forms an acute angle with the longitudinal margin of the diaper defining a means for folding back a corner of said diaper bearing said release region to expose said adhesive layer on said free working end for attachment to the outside surface of the diaper when the diaper is applied to the infant.

3,954,107

ARTICULATED SANITARY NAPKIN PAD

Sheldon R. Chesky, Algonquin, and Donald Patience, Barrington, both of Ill., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sept. 6, 1974, Ser. No. 503,887
Int. Cl.² A61F *13/16*
U.S. Cl. 128—290 R **7 Claims**



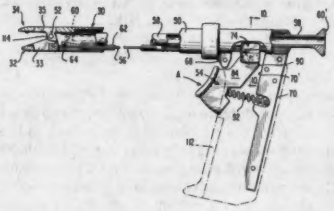
1. Absorbent pad means for the perineum comprising, an absorbent pad assembly having a pair of separate slightly spaced elongated absorbent pad sections each having a front surface for facing the perineum, a back surface, outer side surfaces extending between said front and back surfaces, and inner side surfaces facing each other to define therebetween a longitudinally extending fluid receiving channel between said pad sections adjacent the lateral mid-point of the pad assembly, said pad assembly having hinge means connecting the pad sections adjacent their back surfaces for separation of the pad sections during use, said hinge means comprising an elongated fluid impervious sheet extending between and covering the back surfaces of the pad sections, with said impervious sheet extending along said outer side surfaces to the front surface of the pad sections to prevent fluid leakage from the pad sections during use, said pad sections separating during use to expose an increased area of the pad assembly.

3,954,108

OCCLUSION CLIP AND INSTRUMENT FOR APPLYING SAME

Hugh J. Davis, 2 E. Highfield Road, Baltimore, Md. 21218

Division of Ser. No. 303,314, Nov. 3, 1972, Pat. No. 3,856,016.
This application Aug. 27, 1974, Ser. No. 501,079
Int. Cl.[2] A61B 17/12
U.S. Cl. 128—325 9 Claims



1. An instrument for applying an occlusion clip on an anatomical tubular structure, which clip is composed of a bendable material, comprising an elongated substantially tubular housing of at least sufficient length to extend through an opening in the umbilicus to a position adjacent the fallopian tube, said tubular housing carrying at its forward end a pair of jaw means which are movable relative to one another with the bendable clip disposed between said jaw means between an open, clip-receiving position and a closed, clip-applying position, said jaw means extending longitudinally beyond the forward end of said substantially tubular housing but having a width when said jaw means are in an open position that is compatible with the width of said housing, for insertion while said jaw means are in an open position, into an incision of such small size as to accommodate said housing, actuating means on said instrument and reciprocable longitudinally of said housing for selectively closing the jaw means including control means for producing a controlled closure of the clip from said open, clip-receiving position to said closed, clip-applying position, said jaw means having forward ends which are movable toward and away from each other to close and to open said jaws, and said jaw means having rearward ends which are spaced apart from each other, throughout the closing and opening movement of said jaws.

3,954,109

BANDAGE TO PREVENT LOCAL HEMATOMA

Harish A. Patel, Oak Park, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Aug. 2, 1974, Ser. No. 494,106
Int. Cl.[2] A61B 17/12
U.S. Cl. 128—327 32 Claims

31. A pressure bandage for a puncture site in a patient, comprising:

absorbent pad means for applying a variable amount of increased pressure to the site responsive to the extent of bleeding from the site; and

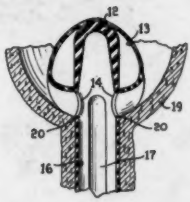
means for securing the pad means over the site.

3,954,110

RETENTION CATHETER WITH BILOBATE BALLOON

Ernest L. Hutchison, No. 5 Southern Pines Drive, Pine Bluff, Ark. 71601

Filed Jan. 24, 1974, Ser. No. 436,232
Int. Cl.[2] A61M 25/00
U.S. Cl. 128—349 B 3 Claims



1. A flexible balloon type closed-end catheter comprising an elongate tubular body portion defining a drainage lumen, an elastic inflatable smooth-surface thimble-shaped balloon sheathed over the distal end portion of said body portion, a pair of diametrically opposed eyes apertured through the wall of said tubular body portion, said eyes being disposed adjacent to the proximal marginal portion of said thimble-shaped balloon and extending distally therebeyond, said balloon having a pair of diametrically opposed openings in registration with said eyes and said balloon being attached to the body portion at the distal tip and hermatically sealed along the proximal margin thereof to the body portion including the marginal portions along said balloon openings, and a coextensive tubular inflation lumen within said tubular body portion in communication with said balloon through an aperture in the wall of said body portion, said balloon defining a bilobate configuration in response to delivery therein of an inflation fluid through said inflation lumen, each lobe of the balloon distending symmetrically outwardly from the eyes to assure unobstructed access thereto.

3. The method of precluding the formation of a pool of liquid within the bladder of a human body which includes the steps of

moving the balloon end portion of a balloon-type catheter through the associated urethra only until the first appearance of liquid at the proximal end of the catheter lumen, and

distending an initially uninflated smooth-surfaced thimble-shaped balloon sheathed over the distal end portion of the catheter to an inflated symmetrical bilobate configuration to provide between the lobes a pair of diametrically opposed upwardly indented drainage passageways along the underside of the re-formed balloon, each passageway terminating at an associated drainage eye opening to the lumen of the catheter.

3,954,111

ELECTRIC THERAPEUTICAL APPARATUS WITH AUDIO FREQUENCY BAND ALTERNATING CURRENT

Koh Sato, 14 of 670, Tarumachi, Kohhoku, Yokohama,, Japan

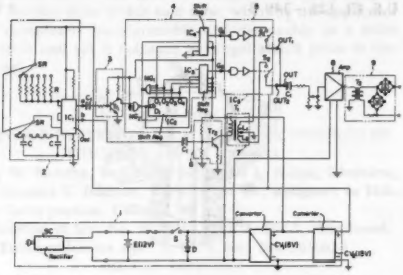
Filed July 17, 1974, Ser. No. 489,113
Claims priority, application Japan, Dec. 28, 1973, 46-2027
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—419 R 2 Claims

1. An electric therapeutical apparatus for treating cells in a human body comprising:

a pair of means for transmitting a current to a human body; and

means electrically connected to said transmitting means for producing said current as at least two identical groups of alternating current wave-forms separated by a period of zero amplitude, each of said groups of wave-forms being a continuous sinusoidal wave-form having a fundamental

frequency selected from audio frequencies ranging between 250 and 6000 Hz at voltages within ± 300° and being not more than about 50 mA, each group of waveforms not to exceed sixteen full cycles and may be a half



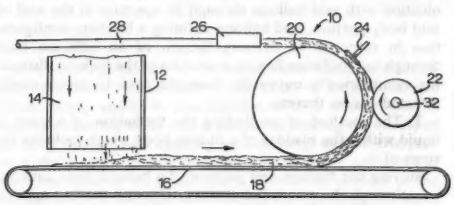
a cycle less than a full cycle, said period of zero amplitude being in the range of one half the period of a cycle of said sinusoidal wave-form to three and one half times the period of a cycle of said sinusoidal wave-form.

3,954,112

TOBACCO FILLER ROD PRODUCTION

Warren A. Brackmann, Cooksville, and Daniel Di Ianni, Toronto, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed Aug. 5, 1974, Ser. No. 494,728
Int. Cl.² A24C *5/18*
U.S. Cl. 131—21 D **6 Claims**



1. In a cigarette-making apparatus comprising filler stream-forming means, conveying means for conveying said filler stream to a cigarette rod-forming means, vacuum inducing means operatively associated with said conveyor means for applying suction to a filler stream conveyed by said conveyor means and tobacco trimming means mountiing in a substantially fixed location spaced from said conveyor means in cooperative relationship therewith to remove tobacco from a filler stream on said conveyor means above a predetermined height from said conveyor means, the improvement comprising filler stream manipulating means located adjacent to and upstream of said trimming means for subjecting the tobacco in each successive incremental length of the filler stream to a compressive force towards said conveyor means, said filler stream manipulating means including a plurality of movable individual compressive force-applying members arranged successively to contact successive incremental lengths of said filler stream, centrifugal force-imparting means and magnet means associated with said individual force-applying members and arranged to impart force to said individual force-applying members of magnitude increasing proportionally with distance of movement of said force-applying members into said contact with said successive incremental lengths, whereby each incremental length of filler stream is subjected to a compressive force equivalent to the force of the individual force-applying member contacting the same and gained in motion to the incremental length under the influence of a combination of centrifugal forces and magnetic forces.

3,954,113

METHOD OF AND MEANS FOR CLEANING HAIR BETWEEN SHAMPOOS AND METHODS FOR PREPARING SUCH MEANS

James Calvin Bohrer, East Brunswick, and Gordon Trent Hewitt, Upper Montclair, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 14, 1973, Ser. No. 424,816
Int. Cl.² A45D *7/00*
U.S. Cl. 132—7 **17 Claims**

1. An article of manufacture suitable for removing hair soil between shampoos comprising a coherent, sheet-like, fibrous, absorbent substrate having bonded to its surface at least .01% by weight of a cationic, organic polyelectrolyte selected from the group consisting of polymers of C_1-C_4 alkylenimines and quaternary ammonium polymers, said polyelectrolyte having numerous charge sites thereon to render it electronically attractive to soil, which is moistened with at least about 20% by weight of an aqueous C_2–C_4 alcoholic cleaning liquid.

3,954,114

LIPSTICK CASE

Efrem M. Ostrowsky, Highland Park; William G. Crowle, Deerfield, both of Ill., and Thomas H. Hayes, Westport, Conn., assignors to VCA Corporation, Baton Rouge, La.

Continuation-in-part of Ser. No. 439,500, Feb. 4, 1974, abandoned. This application Dec. 19, 1974, Ser. No. 534,197
Int. Cl.² A45D *40/26*
U.S. Cl. 132—88.7 **19 Claims**

1. A dispensing holder for lipsticks and the like, comprising, in combination:

a. a substantially cylindrical casing having an open top end,

b. a thin, wafer-like closure member disposed in the casing and adapted to span the open end thereof,

c. a flexible push-pull strap connected to said closure member and having an exposed finger piece,

d. guide means on the casing to guide said strap and closure member for movement between a retracted position wherein the closure member is removed from said open end and closely underlies a side portion of the casing, and an advanced position wherein the closure member spans the casing top and closes said open end,

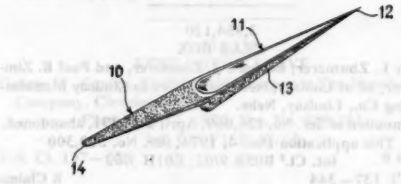
e. said open top end of the casing having a rim characterized by a pair of opposite convex portions joined to each other by a pair of opposite concave portions whereby said rim lies in a curved, undulating surface,

f. said closure member being concavo-convex for both its retracted and its advanced positions, and closely fitting said top rim when advanced, so as to constitute a substantially tight closure therefor.

3,954,115
COMBINED TOOTH PICK AND TOOTH CLEANING IMPLEMENT

Sigurd Walter Bengtsson, Bruksgatan 17, 414 51 Goteborg, Sweden

Filed Sept. 22, 1975, Ser. No. 615,572
Claims priority, application Sweden, Sept. 24, 1974, 119611
Int. Cl.² A61C *15/00*
U.S. Cl. 132—89 2 Claims

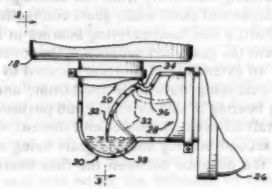


1. A combined tooth pick and tooth cleaning implement made of resilient synthetic resin material, comprising:
   a. a cleaning portion having two side walls merging into a ridge and defining a channel-shaped cross-section tapering into a first tip, the open side of the channel extending straight toward said first tip, and said ridge tapering into said first tip; and
   b. a picking portion having a solid cross-section merging at its base directly into said cleaning portion and having a tapering contour extending to a second tip, said picking portion being a planar leaf-like elongation of said open side, and said base being substantially equal in size to the greatest breadth of said cleaning portion.

3,954,116
SOUND-DAMPENING CONNECTION

Lauren W. Guth, and Donald S. Cushing, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Apr. 1, 1975, Ser. No. 563,972
Int. Cl.² B08B *3/02*; F01N *1/16*
U.S. Cl. 134—183 4 Claims

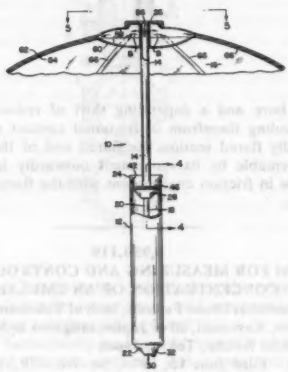


1. In a dishwasher having a tub including a mouth, opposed sides, and a bottom defining a wash chamber, the tub bottom having an aperture therein opening into a pump-motor compartment therebelow; a door for closing the tub mouth, a plurality of superposed article-receiving racks mounted for movement through the mouth between washing and loading positions, in and at least partially out of the chamber, respectively; spray means mounted within the tub in liquid-distributing relation to the receiving racks for directing washing liquid toward the racks, a pump-motor arrangement residing below the tub, said pump-motor arrangement further having a pump inlet below the tub bottom, the improvement comprising:
   a liquid-containing trap connection for connecting the aperture of the tub to the pump in fluid flow relationship, said trap connection including a tongue member within said trap extending from a point above the liquid level in the trap connection and terminating at a free end below the surface of the liquid in the trap connection to dampen sound from said pump-motor arrangement.

3,954,117
INFLATABLE UMBRELLA

William E. Wallace, 1851 Arlington St., Sarasota, Fla. 33579

Filed Jan. 23, 1975, Ser. No. 543,643
Int. Cl.² A45B *19/02*, *19/04*
U.S. Cl. 135—20 B 10 Claims



1. An inflatable umbrella, said umbrella comprising: a housing means comprising an elongated tube and including fluid conduit means formed within said housing and extending substantially coincidental with the longitudinal dimension of said housing means; sleeve means movably disposed within said housing means, at least a portion of said sleeve means being disposed in surrounding relation to said fluid conduit means, said sleeve means comprising cap means formed at one end thereof in engaging relation to the top of said housing means and locking means formed on said sleeve means in cooperative relation to said housing means whereby said sleeve means may be held in an open, extended relationship to said housing means; and protector means formed from a flexible material including at least one fluid passage formed therein, at least a portion of said protector means being attached in fluid communicating relation to said sleeve means, whereby a fluid may be introduced through said fluid conduit means, through said sleeve means, and through said one fluid passage to inflate said protector means to a predetermined configuration; said housing means further comprising stop means formed thereon in engaging relation to at least a portion of said locking means when said sleeve means is extended from within said housing means, said stop means comprising at least one dimple formed on the outside of said fluid conduit means a predetermined distance from the top end thereof.

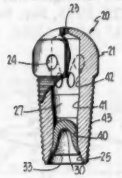
3,954,118
FLUID PRESSURE RELIEF DEVICE

Stewart Wilcox, 7024-A Darby Ave., Reseda, Calif. 91335

Continuation of Ser. No. 381,163, July 20, 1973, abandoned.
This application Oct. 7, 1974, Ser. No. 512,649
Int. Cl.² F16K *13/04*
U.S. Cl. 137—67 5 Claims

1. A pressure relief device comprising:
   1. a body having an interior bore;
   2. means for retaining an inner end of said body in the wall of a container with which the device is to be associated;
   3. pressure relief ports leading from an intermediate section of said bore to a position outside of the retaining means;

4. an outwardly flared section on the inner end of said bore; and
5. an elongated friction plug of deformable material adapted to fit in the flared section of said bore, and formed with a hemispherical outer end for extending into



the bore and a depending skirt of reduced thickness extending therefrom in frictional contact with the outwardly flared section the flared end of the plug being deformable by its movement outwardly into the bore while in friction engagement with the flared wall of the bore.

3,954,119

SYSTEM FOR MEASURING AND CONTROLLING THE CONCENTRATION OF AN EMULSION

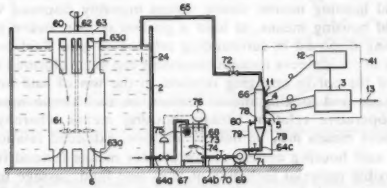
Kazuo Kunioka; Shuzo Fukuda, both of Yokohama, and Kinya Inamoto, Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed June 13, 1974, Ser. No. 479,113

Claims priority, application Japan, June 22, 1973, 48-70570; July 19, 1973, 48-80460; Apr. 30, 1974, 49-48587; Apr. 30, 1974, 49-48588

Int. Cl.² B21B *27/06*

U.S. Cl. 137—92 **17 Claims**



1. A system for measuring and controlling the concentration of a plural component emulsion comprising:

a measuring means receiving at least a portion of said emulsion and including a circulation line conducting at least a portion of the emulsion through the measuring means; and a detecting device coupled to said circulation line for detecting the concentration of said emulsion and for generating an output signal corresponding to said concentration, thereby determining the concentration of the emulsion conducted through said measuring means; and

control means coupled to said detecting device and supplied with an output signal delivered from said detecting device to control the concentration of the emulsion flowing through said measuring means to a desired level;

said detecting device including an ultrasonic transmitter for emitting ultrasonic waves into said emulsion conducted through said measuring means; an ultrasonic receiver for receiving ultrasonic waves emitted into said emulsion from said ultrasonic transmitter and for generating an electrical output signal; a device for generating an electrical signal corresponding to the velocity of the ultrasonic waves propagating through said emulsion, in response to said electrical output signal delivered from said ultrasonic receiver; a device for detecting the temperature of an emulsion conducted through said measuring means and generating an electrical signal corresponding to said detected temperature; and a temperature compensation device for correcting a signal corresponding to the propagation velocity of said ultrasonic waves as a function of a signal corresponding to the temperature of the emulsion by the joint action of said electrical signal generated by said propagation velocity signal-generating device and said electrical signal delivered from said temperature signal-generating device, thereby producing an output signal corresponding to the actual concentration of said emulsion.

3,954,120

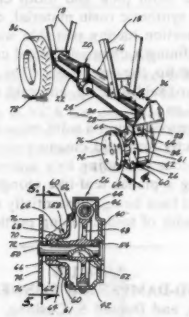
GEAR BOX

Arthur L. Zimmerer; Bernard J. Zimmerer, and Paul B. Zimmerer, all of Lindsay, Nebr., assignors to Lindsay Manufacturing Co., Lindsay, Nebr.

Continuation of Ser. No. 136,069, April 21, 1971, abandoned. This application Dec. 4, 1974, Ser. No. 529,300

Int. Cl.² B05B *9/02*; E01H *3/02*

U.S. Cl. 137—344 **8 Claims**



1. A gear box, comprising a housing, an input shaft rotatably extending into the housing, an output shaft generally in perpendicular relation to the direction of the input shaft and rotatably extending outwardly from the housing, said output shaft having inner and outer ends, gears connecting the input and output shaft, a first load-carrying bearing in the housing closely adjacent the gears and supporting the inner end of the output shaft, an extended hub portion secured to one side of the housing extending outwardly therefrom, and a second load-carrying bearing in said extended hub portion supporting the output shaft adjacent the outer end thereof, the distance between the second bearing and the gears being substantially greater than the distance between the first bearing and the gears.

3. A support tower for use in a self-propelled irrigation system which includes an elongated water distribution pipe supported at intervals by movable towers, the tower including a generally upright elongated frame with a ground-engaging wheel on each end and to one side laterally of the frame supporting the system for movement over a field to be irrigated, an electric motor on the frame functioning as a power source to rotate at least one of the wheels, and a gear box mounted on one end of the frame and extending laterally outwardly from one side thereof in a direction toward and joined to the said one wheel, the gear box including a housing with a rotatably mounted input shaft extending generally parallel to the frame and connected to the electric motor with a worm gear thereon in the housing, a rotatably mounted output shaft misaligned with and at right angles to the input shaft with a worm wheel thereon in the housing in engagement with the worm gear, the output shaft extending outwardly of the housing toward and connected to the ground-engaging wheel, load-carrying bearings in the housings on each side of

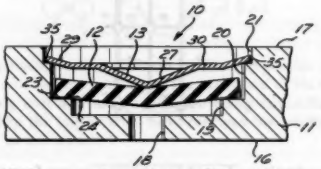
the worm wheel and supporting the output shaft for free rotation in the housing, the first such bearing being on the inner end of the output shaft in a position remote from the ground-engaging wheel and closely adjacent the worm wheel, and the second such bearing being on the outer end of the output shaft in a position adjacent the ground-engaging wheel, the distance between the bearings being substantially greater than the distance between the second bearing and the vertical load plane of the ground-engaging wheel so that the overhung load applied to the bearings caused by the ground-engaging wheel being offset to one side of the frame will be carried by the substantial spacing of the bearings.

3,954,121

VENT CHECK VALVE

George W. Kardos, Euclid, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Mar. 17, 1975, Ser. No. 559,261
Int. Cl.² F16K *15/14*
U.S. Cl. 137—525 **8 Claims**



1. A vent check valve comprising a body having a vent for exhausting fluid to the atmosphere, the vent of the body including an inner bore, means providing communication from the interior of the body to the inner bore, a counterbore axially outward of the inner bore, said counterbore including a generally radial face adjacent its inward end, said radial face intercepting the outer end of said inner bore to form an annular seat, a resilient diaphragm disposed in said counterbore, bore means axially outward of the portion of said counterbore in which said diaphragm is disposed, said bore means being nonre-entrant along its axis, a diaphragm retainer of resilient sheet material disposed in said bore means, said retainer having a radially and axially outward, relatively flat area dimensioned to provide an interference fit with said bore means preventing release of said retainer from said bore means, said retainer including at its center means for deflecting a central portion of said diaphragm into said inner bore and normally biasing radially outward portions of said diaphragm into sealing engagement with said seat and permitting said radially outward portions of said diaphragm to flex axially outwardly away from said seat under the influence of fluid pressure in said inner bore in excess of atmospheric pressure, said retainer including means for permitting exhaust of fluid past said diaphragm to the atmosphere on the exterior of said body.

3,954,122

COLD PRESSURE WELD, AND LOW-PRESSURE PIPING SYSTEM CAPABLE OF BEING MADE WITH THIS COLD PRESSURE WELD

Theodorus Gerrit Abrahamsen, Koudekerk ander Rijn, and Tom deBlieck, Krimpen ander IJssel, both of Netherlands, assignors to Ultra Centrifuge Nederland N.V., The Hague, Netherlands

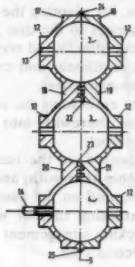
Filed Oct. 5, 1973, Ser. No. 403,855
Claims priority, application Netherlands, Oct. 11, 1972, 7213724
Int. Cl.² F16L *19/00*
U.S. Cl. 137—561 A **4 Claims**

1. A high vacuum piping system comprising

a plurality of headers, at least one header of which is connected to a number of distributing pipes,

a multiple header comprised of at least two of said plurality of headers, the central axes of said headers of said multiple header being located in one common central plane,

means for connecting said headers of said multiple header together, said means comprising at least one jointing wall portion which is located between the headers it connects together and constitutes a part of each of them,



said multiple header being divided along the central plane into two separate components, said components having cooperating junction surfaces, and

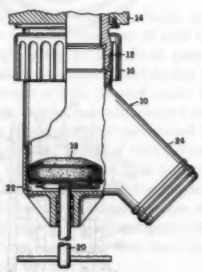
means for hermetically sealing said separate components along said junction surfaces, said means comprising a cold state compression pressure weld at at least one junction surface.

3,954,123

AIRCRAFT LAVATORY DRAIN PLUG

Milton D. Duckworth, Jr., 1316 Orchard Lakes, St. Louis, Mo. 63141

Filed Dec. 9, 1974, Ser. No. 530,679
Int. Cl.² F16L *35/00*
U.S. Cl. 137—800 **2 Claims**



1. In combination with a valve of the type attachable to an aircraft lavatory drain port, the valve being generally tubular and axially alignable with the port and having a lateral outlet integratedly formed therewith, the valve including means for engaging a port plug to move the plug into and out of engagement with the port, the improvement comprising:

the port plug comprising:

a. a base plate;

b. a first cam mounted on the base plate in fixed relationship therewith;

c. radially expandable means connected for relative rotatable relationship with the first cam, the radially expandable means including:

i a disc portion; and

ii radial expanders pivotally mounted on the disc, each of the expanders including a radially inwardly facing peripheral surface being generally annular and having alternate curvilinear and rectilinear portions;

d radially outwardly facing peripheral surface means on the first cam being generally annular and having alternate curvilinear and rectilinear portion for cooperating engagement with the alternate curvilinear and rectilinear portions, respectively, of the expanders, and, upon relative rotating motion between the first cam and the expandable means, for pivoting the expanders radially outwardly with respect to the disc portion due to engagement of the curvilinear and rectilinear portions of the cam with the rectilinear and curvilinear portions, respectively, of the expanders;

e resilient seal means embracing the expanders for radial outward expansion therewith into radial sealing engagement with the port;

f a second cam mounted on the base plate in relative rotatable relationship therewith; and

g locking means mounted on the base plate for outward slidable radial extension thereof with respect to the base plate into locking engagement with the port upon rotation of the second cam

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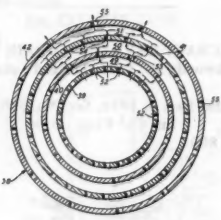
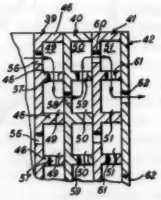
3,954,124

HIGH ENERGY LOSS NESTED SLEEVE FLUID CONTROL DEVICE

Richard E. Self, 3221 Brimhall Drive, Los Alamitos, Calif. 90720

Filed Dec. 5, 1973, Ser. No. 421,972
Int. Cl.² F15D *1/00*; F16K *47/00*, *47/08*
U.S. Cl. 138—42 **19 Claims**





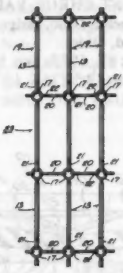
2. A cage for an energy loss fluid control device which comprises a plurality of nested concentric peripherally grooved rigid inner, intermediate and outer tubular sleeves defining nested tiers of axially and radially separated annular chambers, each of said sleeves having an inner periphery and an outer periphery axially spaced rings of circumferentially spaced radial orifices in the inner periphery of the inner sleeve and the outer periphery of the outer sleeve, and additional rings of circumferentially spaced orifices in each intermediate sleeve connecting the annular chambers and arranged in circumferentially offset relationship in each chamber to cooperate with the rings of orifices in the inner periphery of the inner sleeve and the outer periphery of the outer sleeve to define tortuous flow paths extending radially through the cage for imparting frictional resistance to the flow of fluid and thereby dissipate energy in the fluid.

3,954,125

WIRE LINK CHAIN AND WIRE FABRIC AND METHOD AND APPARATUS THEREFOR

Horst F. Wentzek, Kenosha, Wis., assignor to Frank L. Wells Company, Kenosha, Wis.

Filed Apr. 9, 1975, Ser. No. 566,230
Int. Cl.² B21F *27/04*
U.S. Cl. 140—3 A **25 Claims**



1. A mechanism adapted for twisting an eye formed at one end of a U-shaped link, said mechanism comprising a frame, an input shaft supported by said frame for rotation and adapted to be rotated by a power source, means of said frame for gripping the link against movement and with the eye extending from said gripping means, and means on said frame and connected to said input shaft for twisting the eye in one direction through a first angular distance in response to one portion of the rotational cycle of said input shaft and for additionally twisting the eye in said one direction through an additional angular distance in response to another portion of the rotational cycle of said input shaft, said twisting means including a rotatable head engagable with the extending eye and a linkage connected between said input shaft and said head and including two alternately moving portions.

3,954,126

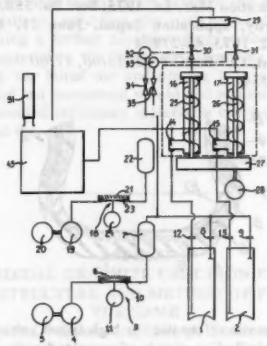
AUTOMATIC DISPENSER FOR THE MANUFACTURE OF ICE CREAM IN VARIOUS SINGLE OR MIXED FLAVOURS AND DISPENSING IN CUPS AND/OR WAFER CONES

Giuseppe Stefano Piana, Milan, Italy, assignor to Piana S.p.A., Milan, Italy

Filed Feb. 25, 1974, Ser. No. 445,338
Claims priority, application Italy, Feb. 23, 1973, 20758/73
Int. Cl.² B65B *31/00*
U.S. Cl. 141—48 **9 Claims**

1. An automatic dispenser for ice cream of various single or blended flavors, dispensed either in cups or/and wafer cones, comprising one or more moveably fixed containers for ice cream ingredients; a first compressor group for supplying cold compressed air at a predetermined pressure, the said compressor group being connected to one or more ice cream ingredient mixing containers and chambers; a second compressor supplying a cooling gas, for example, Freon, for cooling the surface of one or more containers and chambers and for cooling a further chamber being provided to receive the said containers and fitted with a fan; an ice cream dispensing unit, a cup and/or cone dispensing unit, a positioner for the said cups and/or cones arranged near the ice cream dispensing unit; the said positioner being associated with a dosing device; a programmer for controlling the operation sequence as fol-

lows: activation of the first compressor group for feeding a predetermined quantity of ice cream ingredients; activation of the second compressor group for feeding the cooling gas to one or more of the holding chambers; activation of the said holding and mixing chambers for feeding the ice cream to the



said dispensing unit; activation of the cup and/or cone dispensing unit and the positioner; the activation of the ice cream dispensing unit and its disactivation being controlled by the doser when the cup or cone have received the predetermined quantity of ice cream.

3,954,127

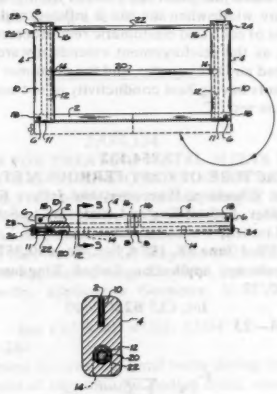
FOLDABLE BUCKSAW

William E. Doxon, 1000 E. 14th St., Hutchinson, Kans. 67501

Filed Mar. 13, 1975, Ser. No. 558,007

Int. Cl.[2] B27B *21/00*

U.S. Cl. 145—32 R **5 Claims**



1. An improved bucksaw of the type having a saw blade, a strut and a tension member, wherein the improvement comprises:

a pair of wood handles each being one-half the length of the saw blade and each handle being pivotally connected at its lower end to an end of the saw blade;

a first hollow running lengthwise along an edge of the handles having a width and depth greater than the saw blade so that when the handles are rotated to the folded condition, the handles house the saw blade; and

a separate second hollow running lenthwise through the interior of the handles which provides housing for the strut and the tension member when the bucksaw is in the folded condition.

3,954,128

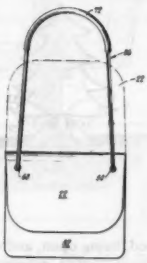
SLING PURSE

James L. Rushing, and Linda S. Rushing, both of 3012 NW. 43rd St., Oklahoma City, Okla. 73112

Filed Dec. 6, 1974, Ser. No. 530,217

Int. Cl.[2] A45C *3/06*

U.S. Cl. 150—30 **2 Claims**



1. A sling purse comprising:

a flexible, open-topped main bag having a bottom panel, back and front panels, and two side panels extending between and joining the back and front panels;

at last one flexible, open-topped pocket secured to one of said back and front panels outside of said main bag and including a facing panel extending substantially parallel to the respective back or front panel to which it is secured, said facing panel having an upper edge terminating at a level even with the upper edges of said back and front panels;

a flexible cover flap secured to the back panel and dimensioned to extend across and cover the open top of the main bag, said main bag and flexible cover flap constituted by a single, unitary piece of leather and said cover flap being stronger and less stretchable than said front, back and side panels; and

an elongated, flexible sling which includes two bight portions at opposite ends thereof, one of said bight portions extending through holes in said front panel, said back panel, one of said side panels, said facing panel of said pocket, and through a hole in said cover flap, and the other of said bight portions being spaced across the top of said main bag from said first-mentioned bight portion and extending through holes in said front panel, said back panel, the second of said side panels, said facing panel and said cover flap, whereby tensioning of said bight portions will draw the upper edges of said front, back and facing panels into juxtaposition with each other, and will close said cover flap over the upper edge of said front panel.

3,954,129

CHRISTMAS TREE WRAP, FLOOR OR RUG PROTECTOR AND DECORATIVE BASE

David C. Rudell, 362 S. Creek Drive, and Jerry C. Storms, 29 Warsaw St., both of Depew, N.Y. 14043

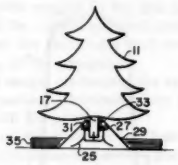
Filed Jan. 2, 1974, Ser. No. 429,939

Int. Cl.[3] B65D *85/70*

U.S. Cl. 150—52 R **10 Claims**

7. A Christmas tree wrap which also functions as a floor or rug protector and decorative base suitable for use in conjunction with display of the Christmas tree, protecting a floor or rug under it and preventing needles or other materials from the tree from contacting such floor or rug and being adapted to cover or wrap the tree when it is to be moved, preventing

the dropping of needles on floors or rugs during said moving or preparation therefor, comprising a synthetic organic polymeric material which, before being employed as a floor or rug protector and decorative base, and before wrapping about a Christmas tree, has the form of an upper cylindrical section connecting to a lower truncated conical section, with the top of the cylinder, corresponding in position to the top portion of



the tree to be wrapped, being open, and with the bottom of the truncated, conical lower section, corresponding to the bottom portion of the tree to be wrapped, having a central opening narrower than the cylinder opening, said lower section being adapted to cover a rug or floor and a supporting stand for the Christmas tree and said bottom being adapted to be fastened near the opening therein to the tree trunk above the stand during display of the tree.

3,954,130

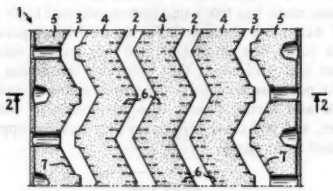
TIRE HAVING TREAD INCISIONS OF VARYING LENGTH

Henri Verdier, Beauregard-l'Eveque, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation of Ser. No. 130,162, April 1, 1971, abandoned. This application Aug. 4, 1975, Ser. No. 601,448

Int. Cl.² B60C *11/12*

U.S. Cl. 152—209 R **3 Claims**



1. A truck tire comprising a tread, said tread being formed, at least in its central portion, with a plurality of grooves defining at least one circumferential rib, the edges of said circumferential rib being formed with transverse incisions closely spaced apart from one another, the length of said incisions in the transverse direction increasing substantially with increasing depth, and the central portion of said rib being substantially free of incisions, wherein said incisions open into said grooves below the surface of said tread in new condition and do not open into the surface of said tread in new condition.

3,954,131

PNEUMATIC SAFETY TIRE

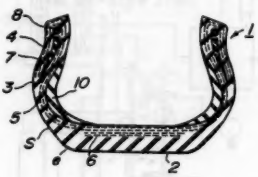
Takashi Hoshino, Tama, and Akira Fujikawa, Kodaira, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 370,262, June 15, 1973, abandoned. This application Mar. 14, 1975, Ser. No. 558,383

Claims priority, application Japan, June 21, 1972, 47-62114; Mar. 12, 1973, 48-27924

Int. Cl.² B60C *9/02*, *13/00*, *17/00*

U.S. Cl. 152—354 **19 Claims**



1. In a pneumatic safety tire for high speed vehicle driving on a highway, including a pair of annular beads, a carcass extending across the two beads, an annular tread portion formed on the outer peripheral surface of the carcass, a pair of shoulders formed at opposite edges of said tread portion and extending toward each bead, a pair of sidewalls formed between one of the beads and the corresponding shoulder portion, the improvement characterized by: a pair of annular elastomeric reinforcements each having at least one elastomer element continuously disposed from the tread portion to the bead portion along the carcass so as to supplement the thickness of said sidewall and thereby enhance the inherent rigidity of the sidewall and its ability to support a load under conditions of reduced tire pressure, each said elastomeric reinforcement consisting of a elastomer having a JIS hardness of not less than 45 and a maximum thickness of from 3 to 15% of the maximum tire width when the tire is inflated under pressure, the thickness of each said elastomeric reinforcement gradually diminishing as the reinforcement extends toward the corresponding bead and tire equator, and the elastomer forming the reinforcements having heat conductivity of not smaller than 5×10^{-4} cal/cm·sec. °C.

3,954,132

MANUFACTURE OF CAST FERROUS METAL DIES

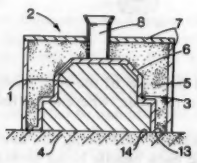
John Robert Wheeldon, Worcester, and Jeffrey Keith Wheeldon, Alcester, both of England, assignors to Selly Oak Diecastings Limited, Worcester, England

Filed June 18, 1974, Ser. No. 480,557

Claims priority, application United Kingdom, June 22, 1973, 57197/72

Int. Cl.² B22C *9/00*

U.S. Cl. 164—23 **5 Claims**



1. Method of manufacturing a cast ferrous metal die comprising the steps of casting an initial die of non-ferrous metal against a basic metal pattern in a mould, the metal of said basic pattern having a melting point substantially not less than that of the non-ferrous casting metal of the initial die, said

basic pattern being preheated and coated with refractory material immediately prior to said casting of the initial die while on casting of the latter the non-ferrous metal is introduced into the mould and against the preheated and coated basic pattern at a temperature below the normal solidification point of the non-ferrous casting metal so as to minimize thermal shock and heat transference between the casting metal and basic pattern, removing the cast initial die from the mould; forming a further corresponding pattern of bonded refractory material in the initial die; removing said further pattern from the initial die and placing it in a mould; and casting in said last mentioned mould and against said further pattern of bonded refractory material a corresponding cast ferrous metal die.

3,954,133

SPHEROIDAL GRAPHITE CAST IRON PIPE OF FERRITIC STRUCTURE AND METHOD OF PRODUCING THE SAME

Tadashi Miyaoka, Nishinomiya; Hiromu Tanimura, Fukuoka; Yoshio Tanaka, Takarazuka, and Susumu Togawa, Amagasaki, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Feb. 20, 1975, Ser. No. 551,310

Claims priority, application Japan, Feb. 23, 1974, 49-21668

Int. Cl.² B22D 7/00

U.S. Cl. 164—76 **6 Claims**

1. A method of producing a spheroidal graphite cast iron pipe of ferritic structure comprising the steps of casting a spheroidal graphite cast iron pipe in a non-chilled condition, withdrawing the casting while hot from the mold and charging it into a furnace or similar chamber, in which the dissipation of the self-heat of the charged cast iron pipe is delayed to provide a controlled gradual rate of cooling of said cast iron pipe at an average cooling rate from 800° – 700°C on the order of 2°–10°C per minute, thereby providing a spheroidal graphite cast iron pipe having a ferritic structure.

3,954,134

APPARATUS FOR TREATING METAL MELTS WITH A PURGING GAS DURING CONTINUOUS CASTING

Hermann Maas, Bochum; Horst Abratis, Hagen, and Claus Raeune, Hattingen, all of Germany, assignors to Rheinstahl Huettenwerke AG, Essen, Germany

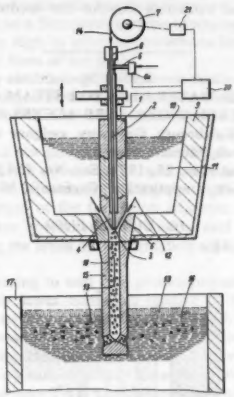
Division of Ser. No. 257,421, May 26, 1972, Pat. No. 3,886,992. This application Aug. 23, 1974, Ser. No. 499,910

Claims priority, application Germany, Mar. 28, 1971, 2126606

Int. Cl.² B22D 41/08, 35/04

U.S. Cl. 164—266 **3 Claims**

1. An apparatus for treating metal melts during continuous casting by means of a continuous casting mold, comprising a pouring vessel, said pouring vessel including means defining a region where the metal melt begins to form a teeming jet, a pouring pipe provided for said pouring vessel and capable of extending to a point beneath the surface of the metal pool in the continuous casting mold, means disposed above said pouring and containing internally thereof a substantially longitudinally extending conduit which opens at its bottom end at the region defining means of the pouring vessel where the metal begins to form said teeming jet, said longitudinally extending conduit being provided at its bottom end with a gas exit opening having a cross-sectional area between 0.2 and 7 square millimeters, said means disposed above said pouring pipe being provided at the region of its upper end with at least one supply means, and wherein said supply means serves for the supply of a purging gas, a further supply means located at the region of the upper end of said conduit, said further supply



means comprising a driven wire roll, drive means for said roll, and a funnel for guiding a wire into said conduit.

3,954,135

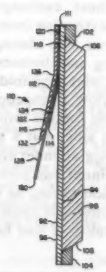
GAS TURBINE ENGINE REGENERATOR SEAL ASSEMBLY WITH FLOATING LEAF SEALING ELEMENT

Robert W. Hewlitt, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 4, 1974, Ser. No. 529,406

Int. Cl.² F23L 15/02; F02C 7/10

U.S. Cl. 165—9 **8 Claims**



1. In a gas turbine engine regenerator seal assembly including a pair of curvilinear seal portions loosely coupled at their ends at joinder points and a crossbar seal portion loosely coupled to and extending between the joinder points, and in which the seal portions each comprise a base plate, low friction seal means attached to one side of the base plate for making sealing contact with the regenerator and a leaf spring sealing element associated with the other side of the base plate and having a sealing edge for making sealing contact with a surface of the engine housing, the improvement in which the base plate of the crossbar seal portion carries means for retaining the crossbar sealing element in floating relationship with respect to the base plate and the sealing element retaining means whereby the crossbar sealing element is substantially unaffected by thermal expansion and contraction of the retaining means and base plate, the retaining means including an elongated leaf spring member having a first elongated edge affixed to said other side of the base plate and a second elongated edge opposite the first elongated edge supported in

cantilever fashion away from the base plate, the sealing element being disposed adjacent to and being at least partially supported by the spring member with the sealing edge of the sealing element extending beyond the second edge of the spring member.

3,954,136

PRESSURIZED-WATER REACTOR STEAM GENERATOR HEAT-EXCHANGER TUBE ACCESS SYSTEM

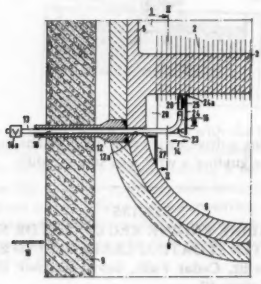
Georg Gugel, Kalchreuth, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 25, 1974, Ser. No. 454,543

Claims priority, application Germany, Mar. 30, 1973, 2316074

Int. Cl. F28f *11/00*

U.S. Cl. 165—11 **4 Claims**



1. A pressurized-water reactor steam generator comprising a housing having a feed-water inlet and a steam outlet and an end portion, a tube sheet closing said end portion and having tube-mounting holes, a heat exchanger bundle of tubes mounted in said holes and extending from said tube sheet, said tube sheet having a bottom side through which said holes open, a chamber enclosing said bottom side, said chamber forming an outlet and/or inlet manifold for said holes, said manifold having coolant flow connections; wherein the improvement comprises a hole formed through said manifold at a level below said bottom side, and a guide tube extending through said hole and having an inner end portion, said guide tube deviating so that the inner end portion is parallel to said tubes, said inner end portion having an open end, said guide tube being movable to register said open end of said inner end portion with any of a plurality of said holes opening through said bottom side.

3,954,137

SUB-SEA WELL RE-ENTRY GUIDANCE APPARATUS

Benton F. Baugh, Houston, Tex., assignor to Vetco Offshore Industries, Inc.

Filed Dec. 11, 1974, Ser. No. 531,706

Int. Cl.² E21B *43/01*

U.S. Cl. 166—.6 **14 Claims**

1. A re-entry guidance apparatus for guiding a first connecting member into connecting engagement with a second connecting member on a submerged well structure, comprising:

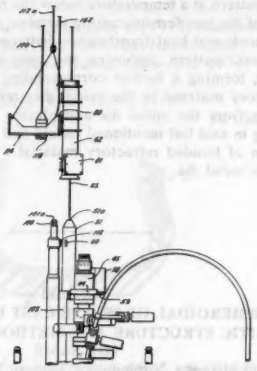
a. a re-entry post extending upwardly from the well structure;

b. a re-entry guideline extendable upwardly from said re-entry post to the water surface;

c. funnel means movable along said guideline to said re-entry post for carrying the first connecting member to the submerged well structure;

d. orienting means on said re-entry post and said funnel means for orienting said funnel means relative to said re-entry post; and

e. mounting face means affixed circumferentially about said funnel means for mounting the first connecting member with said funnel means in any of a plurality of preselected



positions so that with said funnel means aligned relative to said guide post, the first connecting member is aligned with the second connecting member on the submerged well structure.

3,954,138

SAFETY PLUG FOR SEALING-OFF THE TUBING OF A PRODUCING OIL OR GAS WELL

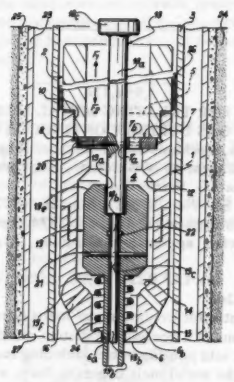
Hubert Miffre, Elancourt, France, assignor to Entreprise de Recherches et d'Activities Petrolieres Elf, Paris, France

Filed Nov. 12, 1974, Ser. No. 523,372

Claims priority, application France, Nov. 14, 1973, 73.40469

Int. Cl.² E21B *33/12, 43/12;* **F16K** *17/36*

U.S. Cl. 166—188 **5 Claims**



1. A safety plug for sealing-off the tubing in a deep producing well in which said plug comprises a body fitted in position by means of O-ring seals within said tubing and contains an axial valve having two heads in opposition which are capable of being applied against the top and bottom seatings of the body, and an axial push-rod unit being connected to the valve, wherein said plug comprises shearable members for positioning the push-rod unit as well as the valve with respect to the body and with respect to the top and bottom seatings, said shearable members comprising two radial locking-pins so arranged that one locking-pin passes through the body and the

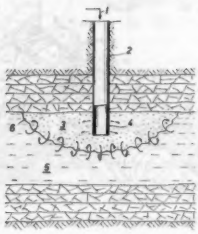
push-rod unit above the top seating and the other locking-pin passes through the push-rod unit as well as the valve which is positioned at equal distances between said seatings, and an expansion member placed between said valve and the lower end of said body.

3,954,139

SECONDARY RECOVERY BY MISCIBLE VERTICAL DRIVE

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 30, 1971, Ser. No. 185,337
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—272 **4 Claims**



1. In a method for producing oil from an oil reservoir penetrated by at least one injection well and at least one production well and the production well is open to the oil stratum at a greater depth from the vertical than the injection well wherein a slug of fluid miscible with and less dense than the reservoir oil is injected into the reservoir through the injection wells to drive the oil downward and oil is produced through the production wells the improvement which comprises

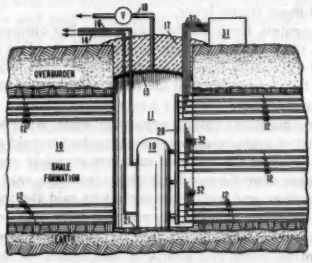
heating the miscible fluid to be injected to a temperature which is above the reservoir temperature so that the injected miscible fluid will have a temperature about equal to the reservoir temperature when the miscible fluid reaches the reservoir.

3,954,140

RECOVERY OF HYDROCARBONS BY IN SITU THERMAL EXTRACTION

Robert P. Hendrick, 801 "D" Ave., Lawton, Okla. 73501

Filed Aug. 13, 1975, Ser. No. 604,299
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—272 **6 Claims**



1. A method of producing hydrocarbons from a hydrocarbon-containing subterranean formation, comprising the steps of:

a. providing a plurality of boreholes extending generally horizontally from a central dug access area into the hydrocarbon-containing formation, said boreholes being provided in vertically spaced relation from top to the bottom of the formation;

b. selectively heating the boreholes adjacent the top of the formation to a first predetermined temperature which is sufficiently high to drive hydrocarbons from the formation in the form of hot gases;

c. selectively establishing fluid communication between the boreholes adjacent the top of the formation and predetermined lower boreholes by external pipe or conduit access;

d. passing said hot gases from the heated boreholes adjacent the top of the formation to said predetermined lower boreholes to effect heat exchange between said hot gases and the areas of the formation adjacent said predetermined lower boreholes, thus cooling said hot gases and preheating the areas of the formation adjacent said lower boreholes;

e. serially heating to said first predetermined temperature successively lower boreholes relative to the top of the formation to drive hot hydrocarbon gases from the formation adjacent said successively lower boreholes, said predetermined temperature moving downwardly through the formation as successively lower boreholes are heated;

f. serially and selectively establishing fluid communication between the successively heated lower boreholes and selected unheated boreholes to exchange heat from the generated hot hydrocarbon gases to the relatively cooler areas of the formation adjacent said unheated boreholes;

g. continuing the serial heating of lower boreholes until all of said boreholes have been heated to said first predetermined temperature; and

h. recovering the hydrocarbons driven from the formation by means of an in-situ heat exchange-refinery apparatus.

3,954,141

MULTIPLE SOLVENT HEAVY OIL RECOVERY METHOD

Joseph C. Allen, Bellaire; Charles D. Woodward, Houston; Alfred Brown, Houston, and Ching H. Wu, Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 406,410, Oct. 15, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,580
Int. Cl.[2] E21B *43/16*
U.S. Cl. 166—274 **21 Claims**

1. A method for recovering viscous petroleum including bitumen from a subterranean, viscous petroleum-containing, permeable formation including a tar sand deposit, the formation being penetrated by at least one well in fluid communication therewith, comprising:

a. introducing a solvent which is gaseous at formation temperature and pressure, into the formation at a pressure at which the gaseous solvent is essentially all in the liquid phase;

b. introducing a solvent which is liquid at formation temperature and pressure, said solvent being selected from the group consisting of paraffinic hydrocarbons having at least six carbon atoms, mononuclear aromatic hydrocarbons, naphtha, natural gasoline and mixtures thereof, into the formation at a pressure at which the solvent is essentially all in the liquid phase;

c. reducing the pressure in at least a portion of the petroleum formation contacted by the solvents to a value at which the gaseous solvent will be at least partly in the gaseous phase; and

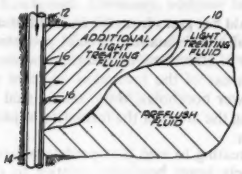
d. recovering a solution of the petroleum and the injected liquid solvent from the formation.

3,954,142

ZONAL FRACTURE TREATMENT OF WELL FORMATIONS

Gene C. Broaddus, and Sherman E. Fredrickson, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 21, 1974, Ser. No. 499,241
Int. Cl.[2] E21B 43/26, 43/27
U.S. Cl. 166—307 15 Claims



1. A method for placing an acidic treating fluid into a desired zone of a fracture in an underground well formation comprising:

introducing a preflush fluid having a known specific gravity into said fracture, and thereafter

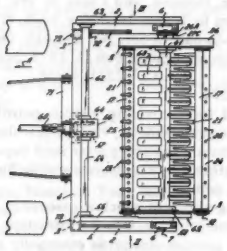
introducing an acidic treating fluid having a specific gravity not equal to the specific gravity of said preflush fluid into said fracture, the specific gravity of said acidic treating fluid being at least about 0.1 less than the specific gravity of said preflush fluid; whereby said acidic treating fluid having a lower specific gravity than said preflush fluid is caused to override said preflush fluid into a desired upper zone of said fracture.

3,954,143

ROTARY PLOUGHS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed May 20, 1974, Ser. No. 471,694
Claims priority, application Netherlands, May 21, 1973, 7307038
Int. Cl.[2] A01B 33/02, 33/12
U.S. Cl. 172—39 37 Claims



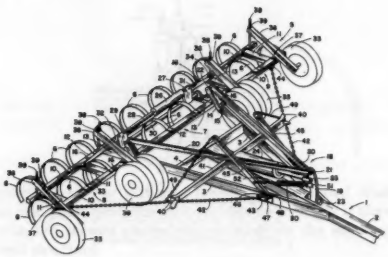
1. A rotary plough comprising a frame and a rotor mounted on horizontal support means on said frame, said rotor having a substantially horizontal axis of rotation, means rotatably mounting soil working means on said rotor so as to be turnable relative to the remainder of said rotor, and movable in a rotary path through the ground to penetrate, loosen and lift successive slices of soil upwardly out of the ground, means rotatably connecting at least one scraping member on said support means within said path and said scraping member being positioned to describe a path that intersects said rotary path of said soil working means during operation and remove soil from said soil working means, driving means on said plow in driving engagement with said rotor, said scraping member and said soil working means.

3,954,144

FOLDING IMPLEMENT CHAIN LIFTER

Calvin B. Blair, P.O. Box 76, Barnard, Kans. 67418

Filed Mar. 19, 1975, Ser. No. 559,898
Int. Cl.[2] A01B 49/00, 63/32
U.S. Cl. 172—311 9 Claims



1. A foldable soil cultivator comprising:

a main frame with a front end and a rear end, a central wing member hingedly connected to said main frame rear end for pivotal lifting from a horizontal operational position to a generally vertical transport position,

an outer wing member hingedly connected to said central wing member and means for folding said outer wing member forwardly toward said main frame when said central wing member is in said transport position,

an upwardly projecting lever pivotally connected to said main frame for pivotal movement forwardly and rearwardly thereof, an interconnecting link connected to said main frame lever and one of said wing members and pivotally lifting said wing members upon pivotal movement of said main frame lever forwardly of said main frame, motive means connected to said main frame and said main frame lever and operable to selectively pivot said main frame lever,

an elongated, flexible reinforcing member connected at one end thereof to said main frame and extending rearwardly and outwardly from said main frame, said flexible member being connected at the other end thereof to said outer wing member,

an arm member having separated ends, one of said arm member ends being pivotally attached to said main frame for pivoting the other of said arm member ends between a lower elevation and a higher elevation, said arm member other end being connected to said flexible member intermediate said flexible member ends, said arm member being positioned to lift said flexible member as said arm member other end pivots to said higher elevation, and

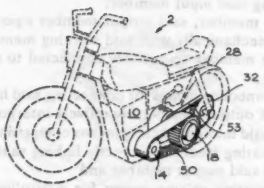
a resilient biasing link means connected to said lever and said arm member, said biasing link means applying resilient force to said arm member, said resilient force being increased by said biasing link means during the lifting of said wing members to urge said flexible member upwardly simultaneously with the lifting of said wing members and prior to the folding of said outer wing member.

3,954,145

DRIVE ARRANGEMENT FOR MOTORCYCLES AND THE LIKE

Glenn S. Nesbit, 6552 San Carlos, Paramount, Calif. 90723

Filed Mar. 1, 1974, Ser. No. 447,214
Int. Cl.² B62D *3/00*
U.S. Cl. 180—33 C **5 Claims**



1. Drive arrangement for motorcycle type vehicles, of the type having an engine, a clutch spaced from the engine, a transmission coupled to the clutch and driven by the engine through the clutch, and at least one drive wheel spaced from the transmission and driven by the transmission for propelling the vehicle, and said clutch having an engaged condition wherein the transmission is driven through the clutch, and a disengaged condition wherein driving of the transmission is prevented by the clutch, the improvement comprising, in combination:

said clutch having an input gear for transmitting power from said engine to said clutch to drive said transmission for said engaged condition of said clutch, and said input gear comprising:

a rotable, cylindrical tubular input sleeve having an outer surface, an inner surface, a first end and a second end, and a first axial width between said first end and said second end;

a cylindrical member coupled to said sleeve adjacent one of said first end and said second end thereof for transmitting rotary motion from said cylindrical sleeve into said clutch, and said cylindrical sleeve cantilevered from said cylindrical member; and

a plurality of premary belt engaging pulley teeth on said outer surface of said cylindrical sleeve extending substantially said first axial width;

said engine has an output gear having a second axial width and having a plurality of primary belt engaging gear teeth thereon and said gear teeth extending substantially said second axial width;

a primary, flexible, endless belt means having a primary belt width and further comprising a plurality of primary belt teeth thereon extending said primary belt width for engaging said belt engaging teeth of said output gear of said engine and said pulley teeth of said cylindrical sleeve of said clutch to transmit power from said engine to said clutch.

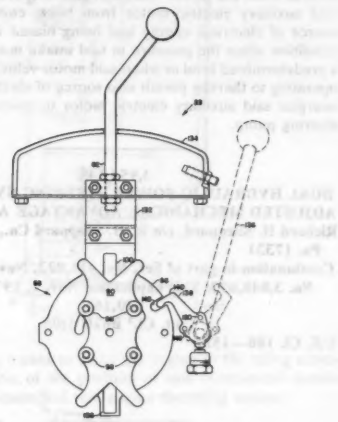
3,954,146

TRANSMISSION CONTROL LINKAGE

Alfred Sigmund Smemo, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 464,310, April 26, 1974, abandoned.
This application May 19, 1975, Ser. No. 578,687
Int. Cl.² F16C *1/18*
U.S. Cl. 180—77 R **15 Claims**

1. A manually operable linkage for controlling the operation of a hydrostatic transmission among neutral, forward and reverse driving conditions, comprising: a first member mounted for pivotal movement about and axial movement along a fixed axis; said first member being angularly shiftable in opposite first and second directions from a neutral position, wherein said neutral condition is established in the transmission, to first and second sets of positions respectively wherein forward and reverse driving conditions are established in the transmission, the speed of the transmission increasing as the angular distance of the first member from its neutral position increases; a second member being fixed alongside said first member; biasing means acting against said first member and engaging a first bearing surface means thereof with a second



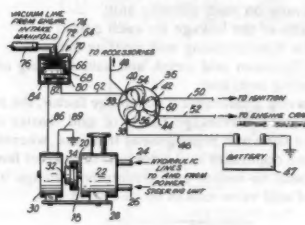
bearing surface means of said second member; and said first and second bearing surface means cooperating to define frictional resistance means for increasingly resisting movement of said first member in said first and second directions from said neutral position as the angular displacement of the first member from its neutral position increases.

3,954,147

POWER STEERING PUMP WITH AUXILIARY ELECTRIC MOTOR DRIVE

Jesse R. Hollins, 40 Stoner Ave., Great Neck, N.Y. 11021

Filed Oct. 3, 1974, Ser. No. 511,779
Int. Cl.² B62D *5/06*
U.S. Cl. 180—133 **1 Claim**



1. A power steering system for a motor vehicle comprising a motor vehicle engine including an engine crank shaft and in intake manifold, an engine ignition system including an ignition lever having an ignition "on" position and "off" position, a power steering unit, a power steering pump for driving said power steering unit, means for driving said power steering pump from said engine crank shaft when said motor vehicle engine is operating and said ignition lever is in the ignition on position, a source of electrical energy connected to said ignition lever when said ignition lever is in the ignition on position, an auxiliary electric motor for driving said power steering pump when energized by said source of electrical energy, a vacuum switch having an open and a closed condition, said vacuum switch being in circuit with said source of electrical

energy, said auxiliary electric motor and said ignition lever when said ignition lever is in the ignition on position, said vacuum switch being connected to said intake manifold and being responsive to the pressure in said intake manifold, said vacuum switch being urged into the open condition when the pressure in said intake manifold is below a predetermined level as when the motor vehicle engine is operating to prevent said auxiliary electric motor from being energized by said source of electrical energy and being biased into the closed condition when the pressure in said intake manifold is above a predetermined level as when said motor vehicle engine is not operating to thereby permit said source of electrical energy to energize said auxiliary electric motor to operate said power steering pump.

3,954,148

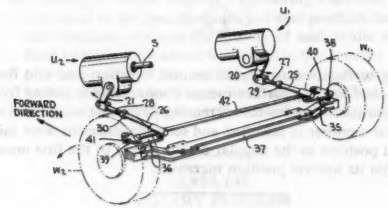
DUAL HYDRAULIC POWER STEERING SYSTEM WITH ADJUSTED MECHANICAL ADVANTAGE AND METHOD

Richard H. Sheppard, c/o R. H. Sheppard Co., Inc., Hanover, Pa. 17331

Continuation-in-part of Ser. No. 411,823, Nov. 1, 1973, Pat. No. 3,848,693. This application Nov. 1, 1974, Ser. No. 520,161

Int. Cl.² B62D *5/06*

U.S. Cl. 180—152 **9 Claims**



1. A dual power steering system including steering linkage connected to the vehicle wheels, comprising:
   - a master steering unit;
   - a slave steering unit;
   - valve means on said master unit for controlling said steering units;
   - an output crank on each steering unit;
   - a steering arm of the linkage for each crank;
   - tie means for synchronizing said steering arms;
   - a drag link between said crank and said steering arm for each steering unit; and
   - each unit having a mechanical advantage factor, the ratio of the mechanical advantage factor of said master unit to that of the slave unit being greater than one, whereby said master unit dominates said slave unit to prevent feedback through said tie means and preemptive change in positioning of said valve means by said slave unit.

3,954,149

HYDRAULIC PRESSURE FLUID CONTROL SYSTEM FOR CONTROLLING THE DISPLACEMENTS OF A DOUBLE-ACTING SERVO-MOTOR

Günther Strauff, Kaarst, Germany, assignor to Langen & Co., Dusseldorf, Germany

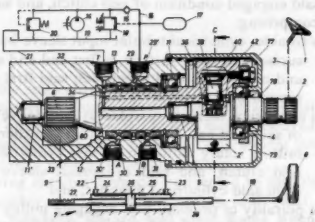
Filed July 1, 1975, Ser. No. 592,233

Claims priority, application Germany, July 27, 1974, 2436315

Int. Cl.² B62D *5/08*

U.S. Cl. 180—148 **2 Claims**

1. A hydraulic pressure fluid control system for controlling the displacements of a double-acting servo-motor comprising:
   - a servo-motor having a two-faced servo piston, a motor body enclosing said servo piston and thereby defining two working chambers, and a working member operatively associated with said servo piston;
   - a hydraulic pressure fluid source having a suction and a discharge;
   - a hydraulic pressure fluid return reservoir connected to said suction;
   - an input member;
   - an operating means attached to said input member for operating said input member;
   - an output member, said output member operatively associated mechanically with said working member;
   - a movable member operatively connected to said working member;
   - an interconnecting means for connecting said input member and said output member operatively interposed therebetween, said interconnecting means comprising a mechanical operating means for directly linking said input member and said output member and
   - a servo assisting valving means for controlling said servo motor, said servo assisting valving means comprising two valve chambers, each associated with one of said working chambers of said servo motor;
   - two control pistons each displacably contained within one of said valve chambers, said control pistons each having a reaction face to which is applied the pressure from the respective working chamber and a coil spring opposing the thrust of the pressure acting on said reaction face, said coil springs causing a predetermined minimum pressure to act on said reaction face and to be maintained in said working chambers, and an actuating means for mechanically operating said control pistons in dependance on the relative motion between said input member and said output member, said actuating means having a rigid coupling connection and a biased elastically yielding coupling which includes said coil springs, said control pistons being arranged so that in a neutral position said working chambers are disconnected from said pressure source and said return reservoir, and when starting from said neutral position said rigid coupling connection being achieved after a predetermined relative motion has occurred between said input member and said output member; and

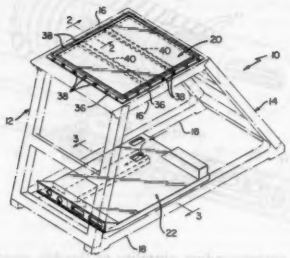


   - conduit means for conveying pressure fluid from said pressure source discharge to each valve chamber, further conduit means for conveying pressure fluid between each valve chamber and its respective working chamber and still further conduit means for conveying pressure fluid from each valve chamber to said return reservoir;
   - the improvement comprising said actuating means further including two spring retainers interposed between said coil springs and said output member and two further coil springs biasing said spring retainers and being arranged concentrically and acting codirectionally with said first-mentioned coil springs and being engaged between said output member and said spring retainers; said spring retainers being arranged to be moved by said input member to further compress said coil springs and said further coil springs when the thrust of said input member exceeds a response threshold established by the bias of said coil springs and said further coil springs.

3,954,150
VEHICLE ROLL PROTECTIVE STRUCTURE

Carroll R. Cole; Warren L. Ferriell; Richard E. Guhl; Frederick C. O'Neill, and Alfred W. Sieving, all of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 29, 1975, Ser. No. 545,258
Int. Cl.² B62D 27/04, 25/20
U.S. Cl. 180—89 R 9 Claims



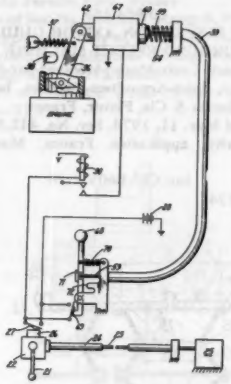
1. In a roll protective structure for use in off-highway vehicles, the combination comprising:
a cab frame defining an operator enclosure area;
a roof panel to protect the operator, said roof panel including a top plate;
said top plate being formed to have a projecting lip about the periphery thereof wherein said projecting lip overlaps the cab frame when said roof panel is placed in close proximity to said frame;
elongated mounting means removably attached to said cab frame and overlapping the entire length of said projecting lip, thereby securing said roof panel to said cab frame to cover the entire ceiling area;
resilient means mounted about said projecting lip to resiliently support in isolating fashion and to prevent metal-to-metal contact between said panel lip and said cab frame and said mounting means;
a floor panel;
second mounting means removably securing said floor panel to said cab frame; and
second resilient means operatively associated with said floor panel to resiliently support in isolating fashion said floor panel from said cab frame and said mounting means.

3,954,151
SAFETY CONTROL FOR MOBILE VEHICLES

Tadeusz Budzich, Moreland Hills, Ohio, and Stanislaw Filip, Toronto, Canada, assignors to KLF Patents, Inventions, and Marketing Corporation Limited, Scarborough, Canada

Filed Apr. 29, 1974, Ser. No. 465,422
Int. Cl.² B60K 28/00
U.S. Cl. 180—103 R 13 Claims

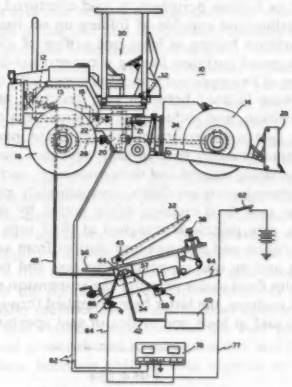
1. In a mobile vehicle comprising a frame, propelling means attached to said frame, an engine mounted on said frame and operably connected to said propelling means to impart motion to said vehicle, engine speed control means including engine throttling means, spring biasing means biasing said engine throttling means towards engine idling position, speed control setting means including mechanical motion transmitting means arranged to operate said engine throttling means, vehicle brake means and vehicle brake actuating means, the combination therewith of a safety control system interposed between said engine throttling means and said mechanical motion transmitting means of said speed control setting means, said safety control system having signal generating means disposed to generate a signal responsive to at least one given operator action, and disconnecting means responsive to said signal from said signal generating means disposed to actuate said disconnecting means, disconnecting said mechanical motion transmitting means of said speed control setting means from said engine throttle means thereby permitting said engine throttling means to bring the engine to the idling condition irrespective of the position of said mechanical motion transmitting means and said engine throttling means.



3,954,152
VEHICLE SPEED CONTROL

Ralph M. Duttarer, St. Joseph, and Richard R. Hushower, Buchanan, both of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed July 15, 1974, Ser. No. 488,336
Int. Cl.² B60K 31/00
U.S. Cl. 180—108 8 Claims



1. In a vehicle having an engine, a multiple ratio transmission and an operator's foot pedal for varying the engine speed, an auxiliary speed control system comprising a device selectively movable into proximity with the foot pedal and away from the foot pedal, the said device arranged when in proximity to the foot pedal to be contacted by the foot pedal when the foot pedal is depressed, the said device including means yieldably resisting depression of the foot pedal when the foot pedal is in contact with the said device, means producing a signal responsive to the speed of the vehicle, and means responsive to the said signal for overriding the said yieldable resisting means positively to limit the amount the foot pedal

can be depressed and thereby limit the speed of the vehicle to a predetermined amount.

3,954,153

SYSTEM OF SUSPENSION AND/OR GUIDANCE FOR GROUND EFFECT MACHINE

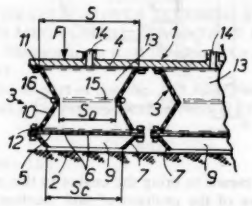
Francis Jean-Marie Croix-Marie, Morsang-sur-Orge, and Paul Aime Lebargy, Saint-Arnoult-en-Yvelines, both of France, assignors to Bertin & Cie, Plaisir, France

Filed Mar. 11, 1974, Ser. No. 442,589

Claims priority, application France, Mar. 13, 1973, 73.08816

Int. Cl.² B60V 1/18

U.S. Cl. 180—124 **4 Claims**



1. A system for supporting and/or guiding a ground effect machine along a supporting surface, which includes: a solid structure incorporating the platform of said machine; a suspension enclosure situated under said solid structure; and a fluid cushion situated under said suspension enclosure and over said supporting surface, whereby said solid structure is approximately parallel to and spaced from said surface; said suspension enclosure being defined by said solid structure, a leak-proof partition and an apertured partition, said leak-proof partition attached at its top periphery to said solid structure and its bottom periphery to said apertured partition and being flexible and capable of folding up on itself, said apertured partition having at least one orifice of calibrated size, said leak-proof partition having a convergent-divergent configuration of two opposed truncated cones with their common smaller base located between said structure and said apertured partition, and including a reinforcement collar located between said solid structure and apertured partition and at said common smaller base of said truncated cones, said configuration being shaped and dimensioned in such manner that said apertured partition floats approximately parallel to said structure; said fluid cushion being bound by said apertured partition, side partitions attached at their tops to said apertured partition and separate and distinct from said leak-proof partition and by said supporting surface, and means for supplying with fluid under pressure the suspension enclosure and also said cushion, the latter being supplied through said enclosure and said at least one orifice of said apertured partition.

3,954,154

TOWED LAND CABLE

John A. Kruppenbach, 4914 Roger Road, Anchorage, Alaska 99502, and John W. Bedenbender, 1617 Westlake Drive, Plano, Tex. 75074

Division of Ser. No. 75,391, Sept. 25, 1970, abandoned. This application Sept. 9, 1974, Ser. No. 504,590

Int. Cl.² G01V 1/16

U.S. Cl. 181—112 **9 Claims**

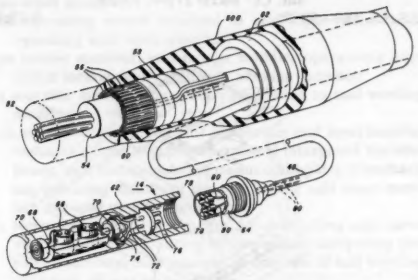
1. A seismic land cable system for towing behind a vehicle, said system comprising:

a. a stress member for withstanding the tension created by the vehicle towing force,

b. a multiconductor electrical cable positioned about the stress member,

c. a jacket covering the stress member and multiconductor electrical cable,

d. a plurality of seismic sensors exterior to said jacket, said sensors including gimbal mounted velocity sensitive geophone elements, and



e. a corresponding plurality of flexible electrical interconnecting means, each of said plurality of flexible electrical interconnectors having an end mechanically fixed to the jacket and electrically coupled to conductors of the multiconductor electrical cable, and opposite ends mechanically fixed to a sensor and electrically coupled to the geophone element of said sensor.

3,954,155

STEPLADDER DOLLY

Orlando Guidara, 79 Livingstone Ave., Beverly, Mass. 01915

Filed Apr. 23, 1974, Ser. No. 463,402

Int. Cl.² E06C 1/397

U.S. Cl. 182—20 **9 Claims**

9. An invertable stepladder dolly comprising a stepladder having a pair of legs, cross members connecting said legs, at least some of which define steps, a support member pivotably connected thereto to support said legs in an inclined position, the uppermost cross member extending forward of said ladder in a durable carry plate, a roller means mounted to the top portion of said stepladder and extending behind said carry plate and said legs such that said stepladder, on being inverted, becomes a dolly with said plate defining the forward projecting carry plate thereof and extending past the plane of said support member, which dolly rides on said roller means.

3,954,156

LADDER ASSEMBLY

Samuel Kennedy, R.R. 1, Mount Albert, Ontario, Canada

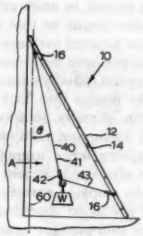
Filed Feb. 26, 1975, Ser. No. 553,107

Int. Cl.² E06C 5/36

U.S. Cl. 182—107 **2 Claims**

1. A ladder assembly comprising a ladder having an upper end and a lower end, first suspension bracket means mounted adjacent the upper end of said ladder and second suspension bracket means mounted adjacent the lower end of said ladder, flexible cable means having a first end connected to said first

suspension bracket and a second end connected to said second suspension bracket, said flexible cable means having a length greater than the length of the ladder extending between said first and second mounting brackets, load support means mounted for movement longitudinally of said flexible cable



means, said load support means including means releasably engaging a load, the length of said cable means being less than that required to permit the load to be suspended vertically from the point of connection of the first bracket member with respect to the upper end of the ladder whereby the load is spaced inwardly toward the lower end of the ladder.

3,954,157

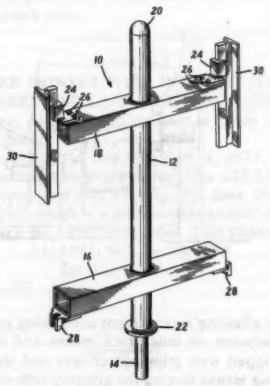
ELEVATOR LIFTING FRAME

Richard E. Atkey, Memphis, Tenn., assignor to Dover Corporation, Memphis, Tenn.

Filed Aug. 16, 1974, Ser. No. 498,200

Int. Cl.² B66B *9/04, 11/04*

U.S. Cl. 187—17 **8 Claims**



1. An hydraulic elevator installation for vertically transporting up and down in a hoistway, an elevator cab having a door, an operating panel and a door return column adjacent the door for housing the operating panel, comprising a piston fixedly mounted in a vertical position in the hoistway; and a lifting frame for carrying the elevator cab, including a cylinder extending upward through the elevator cab in the door return column thereof and slidably mounted about said piston for vertical reciprocating movement thereon, wherein said cylinder forms a rigidly integrated, vertical support member of said lifting frame.

3,954,158

DISC-BRAKE WITH MECHANICAL OPERATION

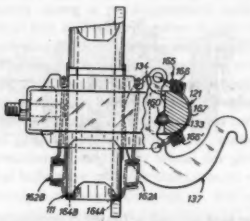
Michel Rist, Boulogne, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Continuation of Ser. No. 339,554, March 9, 1973, abandoned. This application May 6, 1975, Ser. No. 574,906

Claims priority, application France, Mar. 10, 1972, 72.08360; Aug. 8, 1972, 72.28538

Int. Cl.² F16D *55/08*

U.S. Cl. 188—72.7 **32 Claims**



1. A parking type disc brake including a disc mounted for rotation with a member to be braked, a fixed support, a brake shoe arranged on each side of said disc and slidably mounted in openings formed in said fixed support, an operating lever having a cam surface cooperating with one of said shoes, a pivot member pivotally mounting said operating lever on a transfer member, said transfer member being displaceable relative to said disc for transmitting to the other shoe activating force applied by said operating lever, means pivotally mounting said transfer member with respect to said fixed support about a pivotal axis substantially parallel to a line passing through the center of said disc, the axis about which said lever pivots on said transfer member being substantially parallel to said pivotal axis, said operating lever pivoting in a plane substantially perpendicular to and chordal of said disc, said transfer member being a U-shaped stirrup which extends over the edge of the disc and substantially radially outwardly of said disc and said brakeshoes and which is received on said fixed support, said stirrup having two opposed first and second longitudinal surfaces substantially extending parallel to the axis of said disc, resilient means acting on said first longitudinal surface of said stirrup and urging said stirrup in two component directions into engagement with said fixed support including a first component direction urging the stirrup radially inwardly toward the axis of the disc and a second component direction substantially perpendicular to said first component direction urging the said second longitudinal surface of said stirrup into engagement with a corresponding surface on the fixed support while the said first longitudinal surface of said stirrup is free of any engagement with said fixed support, so that when the operating lever is pivoted about said pivot axis the transfer member can be also pivoted against the force exerted by said resilient means about the said pivotal axis parallel to said pivot axis and so move that the said first longitudinal surface becomes oblique with regards to its initial position.

3,954,159

BRAKE SLACK ADJUSTERS

Hugh Grenville Margetts, Leamington Spa, England, assignor to Girling Limited, Birmingham, England

Filed July 2, 1975, Ser. No. 592,459

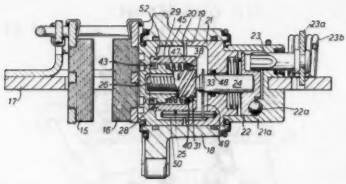
Claims priority, application United Kingdom, July 2, 1974, 29557/74

Int. Cl.² F16D *65/56*

U.S. Cl. 188—196 D **14 Claims**

1. In a hydraulic actuator for a vehicle brake system, said hydraulic actuator comprising first and second components movable apart upon the application of hydraulic pressure

therebetween, at least said first component comprising a piston: an incremental type automatic slack adjuster disposed between said components and comprising an encapsulating container member, means directly and positively attaching said container member to said piston, a slack adjuster mechanism disposed in said container member and including a nut member having an internal screw thread, a strut member having an external screw thread meshing with the internal screw thread of said nut member to form a screw thread connection therebetween, said strut member cooperating with said second actuator component, and means sealing said strut



member to said second actuator component while permitting relative axial displacement therebetween, said adjuster mechanism being operative to turn said nut member responsively to axial travel between said container and strut members in excess of a desired brake slack, said adjuster mechanism including means defining a maximum possible relative axial displacement between said container and strut members, travel between said actuator components beyond said maximum relative displacement between said strut and container members being permitted by axial displacement of said strut member relative to said second actuator component.

3,954,160

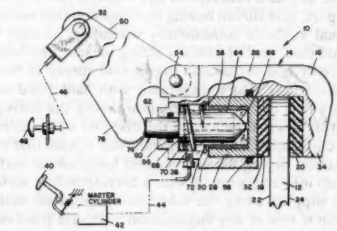
MECHANICALLY ACTUATED DISC BRAKE ASSEMBLY

Scott Carr, 4891 Troth St., Mira Loma, Calif. 91752

Filed May 8, 1975, Ser. No. 575,654

Int. Cl.[2] F16D *65/18*

U.S. Cl. 188—106 F **9 Claims**



1. A disc brake actuator, comprising:

a tubular housing;

a piston having a passageway therein, said piston being slidably disposed within said housing and having a plurality of teeth disposed about said passageway of said piston;

mechanical actuating means including an axially-displaceable plunger having two ends, one end extending into said passageway of said piston and having a taper thereabout forming a tapered nose and said other end extending outside of said piston and forming a cap for engagement with a lever means for axially displacing said plunger;

tubular expander means including a continuous top portion and a longitudinally slotted shank portion forming a plurality of radially expandable fingers with a plurality of externally-arranged teeth thereabout for locking engagement with said piston teeth, said expander means slidably disposed about said plunger adjacent said tapered nose and further having interiorly thereof, adjacent the radially-expandable extremities of said fingers, tapered surfaces for cooperative engagement with said tapered nose of said plunger;

means for constraining the axial displacement of said expander means when said nose of said plunger engages said interior tapered surfaces of said fingers and radially expands said fingers;

said plunger being moved, in unidirectional fashion, further into said expander means so that said plunger nose engages said interior tapered surfaces of said fingers whereupon further plunger nose movement thereinto will cause said fingers to expand radially outward to direct said teeth of said expander means into locking engagement with said piston teeth thereby interlocking said expander means with said piston and simultaneously developing in said fingers a spring force urging said fingers radially inward, wherein afterwards as said plunger is moved still further it thereby imparts corresponding unidirectional motion to said piston to mechanically apply said disc brake, and when said plunger ceases to be urged in said aforementioned unidirectional fashion, as said spring force urgingly directs said fingers to radially contract, a reverse unidirectional movement is imparted to said plunger thereby unlocking said teeth and thereafterwards disengaging said disc brake.

3,954,161

FREE-WHEELING ARRANGEMENT, ESPECIALLY FOR THE GUIDE WHEEL OF HYDRODYNAMIC TORQUE CONVERTERS

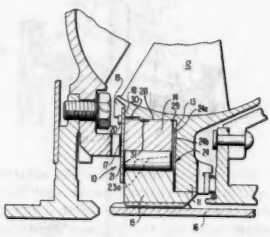
Fritz Ehret, Fellbach; Otto Wörner, Reutlingen, and Ulrich Juskowiak, Stuttgart, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Aug. 26, 1974, Ser. No. 500,710

Claims priority, application Germany, Aug. 28, 1973, 2343288

Int. Cl.[2] F16D *41/06*

U.S. Cl. 192—45 **21 Claims**



1. A free-wheeling arrangement comprising gripping rollers arranged between an inner race means and an outer race means equipped with gripping surfaces and short abutment flanks, spring means forcing the gripping rollers into the gripping position, the spring means being supported on cross tongues of a cage means, and the cage means being formed from an annular member disposed adjacent the gripping rollers, the cross tongues being stamped out of said annular member and being bent approximately at right angle to the plane of the annular member, characterized in that the annular member of said cage means is fixed in the axial direction by a clamping-in action between the outer race means and a structural part receiving the same, in that means are provided for securing the cage means against relative rotation, and in that the free-wheeling arrangement is covered off by a disk means secured at the structural part and serving simultaneously as abutment means for the gripping rollers.

3,954,162

CENTRIFUGAL CLUTCH WITH LATCH CONTROLLED ENGAGING AND RELEASING WEIGHT

Ulrich O. Densow, Peterborough, Canada, assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 6, 1975, Ser. No. 547,638
Int. Cl.² F16D *43/18*
U.S. Cl. 192—105 CE **32 Claims**

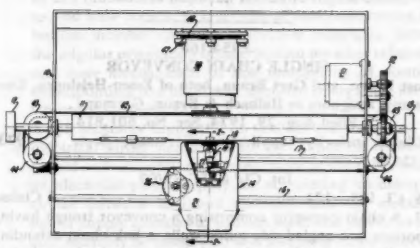
1. A centrifugal clutch comprising a rotatable driver, a clutch drum carried for co-axial rotation relative to said driver, a clutch shoe carried by said driver for common rotation therewith and for movement between a position engaging said clutch drum so as to effect common rotary movement of said driver and said clutch drum and a second position spaced from said clutch drum, a loading shoe, means connecting said clutch shoe and said loading shoe for relative movement therebetween, a trigger movably mounted on one of said loading shoe and said clutch shoe for movement between a first position engaged between said clutch shoe and said loading shoe so as to transmit centrifugal force from said loading shoe to said clutch shoe and a second position of non-engagement between said clutch shoe and said loading shoe, and means on said loading shoe and on said driver operable when said trigger is in said second position for pivoting said loading shoe in response to radially outward movement thereof so as to positively displace said clutch shoe from said position engaging said clutch drum.

3,954,163

HIGH SPEED PRINTER WITH INTERMITTENT PRINT WHEEL AND CARRIAGE MOVEMENT

Andrew Gabor, Alamo, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 394,072, Sept. 4, 1973, abandoned, which is a continuation-in-part of Ser. Nos. 229,314, Feb. 25, 1972, abandoned, and Ser. No. 157,283, June 28, 1971, Pat. No. 3,839,665, which is a continuation-in-part of Ser. No. 23,569, March 30, 1970, abandoned. This application Sept. 11, 1974, Ser. No. 505,105
Int. Cl.² B41J *1/32*
U.S. Cl. 197—53 **10 Claims**



1. An impact printer for printing characters serially on a record medium comprising:

a carriage;

a print wheel rotatably mounted to said carriage and including a plurality of character elements;

first drive means coupled to said print wheel for rotating said print wheel to a desired rotational position in order to place a selected character element at rest in a printing position adjacent a record medium to be printed upon;

print hammer means mounted on said carriage and adapted to impact a selected character element while said character element is at rest in a printing position in order to print on the record medium;

second drive means coupled to said carriage for moving said carriage linearly along a predetermined path whereby said print wheel and said print hammer means are caused to move to printing positions along said path; and

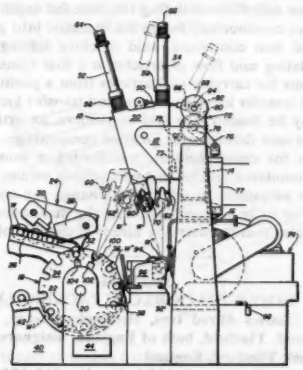
first servo control means coupled to said first drive means for controlling the rotation of said print wheel, said first servo control means including means coupled to said print wheel for generating a position signal indicative of the rotational position of the print wheel, means responsive to the rotation of said print wheel for generating a velocity signal indicative of the instantaneous velocity of the print wheel, and means coupled to said means for generating a position signal and said means for generating a velocity signal for energizing said first drive means first in accordance with said velocity signal until the print wheel is driven to a homing region relative to said desired rotational position and then in accordance with said position signal and said velocity signal as the print wheel is driven further through said homing region to said desired rotational position.

3,954,164

HIGH FREQUENCY LOADER ASSEMBLY

Herbert G. Bottomley, Skipton, England, assignor to Landis Lund Limited, Keighley, England

Filed July 28, 1975, Ser. No. 599,904
Int. Cl.² B65G *47/00*
U.S. Cl. 198—27 **3 Claims**



1. A loader assembly for use with a machine tool comprising

a drum-shaped carrier including a plurality of equispaced workpiece receiving recesses,

means for selectively indexing said drum-shaped carrier,

a workloading chute including means for sequentially advancing a plurality of workpieces to a selected one of said plurality of carrier recesses, and

a loader mechanism including

a housing including

a pair of rams having gripper means at one end thereof, means for selectively displacing said rams intermediate retracted and advanced positions, said rams being

angularly related so that the center points of said gripper elements coincide at the advanced ram positions, and

means for selectively displacing said gripper means intermediate open and gripping positions, and

means for selectively pivotally displacing said housing from a first position whereat said coincident center points coincide with the center line of the stocks of the machine tool to a second position whereat said coincident center points coincide with the center of a second one of said equispaced carrier recesses.

3,954,165

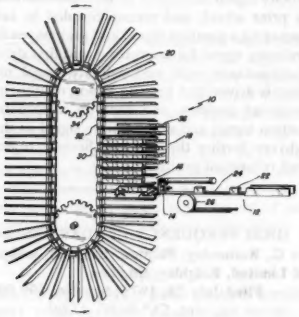
AUTOMATIC COLLATING MACHINE

Clarence A. Snyder, Northbrook, Ill., assignor to R. C. H. Tool Corporation, Morton Grove, Ill.

Continuation-in-part of Ser. No. 379,003, July 12, 1973. This application Aug. 5, 1974, Ser. No. 494,763

Int. Cl.[2] B65G *47/26*

U.S. Cl. 198—34 **13 Claims**



1. In an automatic collating machine for organizing a flow of articles continuously fed to the machine into groups to be packaged into containers, said machine having means for accumulating said flow of articles at a first transfer location and means for carrying said articles from a position adjacent said first transfer location to a second transfer location where they may be loaded into said containers, an article transfer means at said first transfer location comprising:

means for simultaneously transferring a number of the accumulated articles to said carrying means; and

means adjustable to selectively change the number transferred to an amount less than the maximum number of articles that the carrying means is capable of carrying.

3,954,166

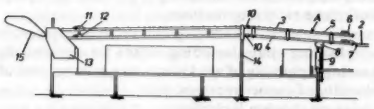
TRIPLE TRACK BACON PACKING LINE

Donald Charles Alfred Ives, Hemingford Grey, and Gerald Harwood, Thetford, both of England, assignors to Danepak Limited, Thetford, England

Filed Oct. 8, 1974, Ser. No. 513,155

Int. Cl.[2] B65B *69/00*

U.S. Cl. 198—39 **1 Claim**



1. Apparatus for the conveying and weighing of unit packages which are to be sold in predetermined weight quantities comprising a source of supply of packages, a pair of conveying devices, means for driving each of said conveyor devices at two different speeds with the first speed being faster than the second speed so that packages deposited on one of said conveying devices may be progressed towards the delivery end of said one conveying device at a faster speed than when said packages are discharged from said conveying device, means for positioning said conveying devices so that one only at a time is adapted to receive packages from said source of said supply and while said one conveying device is receiving packages from said source of said supply the other of said two conveying devices is delivering packages at its delivery end, means for receiving packages from one of the two said conveying devices at a time, a weighing device positioned along said receiving means, means for raising and lowering said receiving means for placing said packages on and removing same from said weighing device, a visual indicator operatively connected to said weighing device to the minimum predetermined weight enabling an operator to select an indicated predetermined make weight piece and add it to the package while the package is stationary and means thereafter for delivering the package at the predetermined minimum weight to a packaging station.

3,954,167

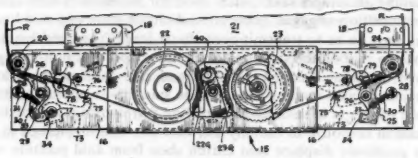
HIGH SPEED PRINTER

Raymond E. Kranz, Mount Prospect, and Benjamin M. Starr, Lake Forest, both of Ill., assignors to Extel Corporation, Northbrook, Ill.

Filed Oct. 17, 1974, Ser. No. 515,509

Int. Cl.[2] B41J *33/518*

U.S. Cl. 197—165 **8 Claims**



1. In combination with a high speed teleprinter apparatus wherein characters are printed by a high speed printing head advancing in short high frequency increments in response to a telegraph circuit, a ribbon reversing mechanism comprising:

a pair of spools for supporting the ribbon, each spool having a driven gear;

a gear train including a pinion gear selectively engageable with each of the driven gears to feed the ribbon in one direction or the other;

a reversing stepping motor energized by the telegraph circuit for incrementally rotating the pinion gear;

means to establish an increment of movement of the ribbon different in dimension compared to the increment of movement of the printing head; and

means for reversing the stepping motor after a predetermined length of ribbon has been extended.

3,954,168

SINGLE CHAIN CONVEYOR

Ernst Braun, and Gert Braun, both of Essen-Heisingen, Germany, assignors to Halbach & Braun, Germany

Filed Aug. 29, 1974, Ser. No. 501,814

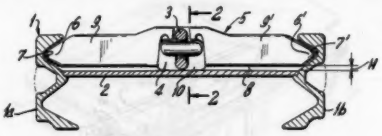
Claims priority, application Germany, Sept. 7, 1973, 7332472

Int. Cl.[2] B65G *19/00*

U.S. Cl. 198—171 **2 Claims**

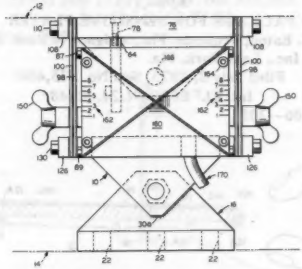
1. A chain conveyor comprising a conveyor trough having a bottom and angled side guide walls, a link chain extending centrally along said trough, a chain support having a lateral guide face on each side and having a width between said side walls substantially equal to a link of said chain and having a bottom face slidable along said bottom, and an integral catch

member having a recessed central portion engaged on said chain support and overlying said link chain and supported on said chain support and having arm portions extending laterally to each side of said chain and said chain support and having inner ends engaged on respective guide faces of said chain



support, said arm portions having outer ends with lateral guide faces guided on said angled side guide walls of said conveyor trough and having bottom surfaces supported above said bottom of said trough and the bottom face of said chain support.

3,954,169
VIBRATING FEEDER DEVICE
LaVerne W. Clark, 22 Merrill Court, Bristol, Conn. 06010
Filed Jan. 23, 1975, Ser. No. 543,420
Int. Cl.² B65G 27/00
U.S. Cl. 198—220 CA **13 Claims**



1. A vibratory feeder device particularly suited for employment in association with automatic machinery for purposes of causing objects to be conveyed thereto comprising:

a. a base means operable as a support for mounting the vibratory feeder device on a mounting surface;

b. a bottom member cooperable with said base means for establishing the vibrating firing angle of the vibratory feeder device;

c. means pivotably mounting said bottom member on said base means for pivotal movement relative thereto to enable said bottom member to be selectively positioned in any one of a multiplicity of angular positions relative to said base means, at least one of said base means and bottom member carrying calibration indicia to identify the angular orientation of said bottom member relative to said base means, each of said multiplicity of positions corresponding to a different calibrated firing angle for the vibratory feeder device;

d. a coil assembly supported on said bottom member;

e. electrical wiring means operatively connected at one end to said coil assembly and connectable at the other end to an electrical power supply for completing an electrical circuit between said coil assembly and the electrical power supply in order to provide electrical power to said coil assembly to cause said coil assembly to be intermittently energized for purposes of providing a magnetic pull from said coil assembly;

f. an armature assembly supported in spaced relation to said coil assembly so as to establish a predetermined armature gap setting between said armature assembly and said coil assembly, said armature assembly being further positioned relative to said coil assembly so as to lie within the magnetic field produced by said coil assembly so as to be drawn towards said coil assembly by the magnetic pull generated by said coil assembly when said coil assembly is in an energized state;

g. a top member operable as a support for mounting tooling thereto;

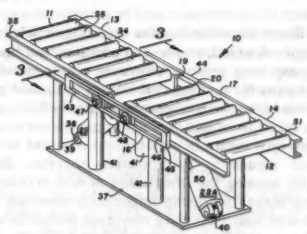
h. means operatively connected at one end to said armature assembly and at the other end to said top member for supporting said armature assembly on said top member and transmitting the motion of said armature assembly to said top member to produce a corresponding movement of said top member;

i. spring means operatively connected at one end to said top member and at the other end to said bottom member and supporting said top member on said bottom member, said spring means comprising a set of spring plates extending between said top and bottom members adjacent each end thereof;

j. first adjustment means cooperatively associated with said spring means and operable for effecting an adjustment of the frequency of vibration of said spring means in order to achieve proper tuning of the vibratory feeder device while the vibratory feeder device is operating, said first adjustment means including an adjustable clamping means extending about each set of spring plates to apply adjustable clamping force thereto and thereby affect the frequency of vibration; and

k. second adjustment means cooperatively associated with said armature assembly operable for effecting an adjustment in the armature gap setting of the vibratory feeder device while the vibratory feeder device is operating.

3,954,170
ROCK SLAB TURNOVER DEVICE
Thomas L. Schlough, St. Cloud, Minn., assignor to Park Tool Company, St. Cloud, Minn.
Filed Dec. 30, 1974, Ser. No. 537,181
Int. Cl.² B65G 47/24
U.S. Cl. 198—236 **3 Claims**



1. Work turnover means for stone slabs and the like comprising, in combination:

a. conveyor means having a work-receiving end, a work-delivering end and with a work turnover section therebetween;

b. said turnover section comprising first and second axially aligned segments, with axial extending elongated slide means arranged laterally along each side of said axially aligned segments for adjustably coupling said segments together, each of said axially aligned segments terminating along mutually adjacent opposed terminal free end surfaces and being normally arranged in closely spaced relationship, one with the other;

c. articulating means for each of said turnover segments including pivot means pivotally mounting each of said axially aligned segments intermediate the ends thereof

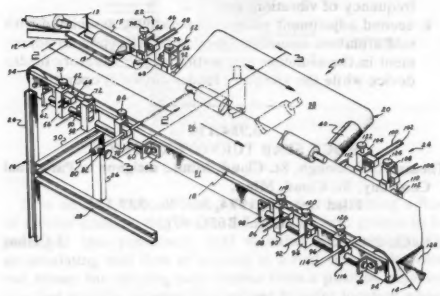
and at a point spaced from said terminal free end and arranging for arcuate pivotal rotation of said segment about a generally horizontal pivot axis disposed at right angles to said turnover section axis, and first and second power sources for delivering reciprocatory motion to each of said axially aligned turnover segments, link means coupling each of said power sources to respective first and second turnover section segments at a point along the turnover segment to which it is attached at a force applying point spaced from said generally horizontally disposed pivot axis, the arrangement being such so as to provide general vertical disposition of each of said turnover segments adjacent said generally horizontal pivot axis, with the terminal ends thereof being spaced apart axially a substantial distance one from the other at opposed ends of said elongated slide means when said turnover segments are in said vertical disposition.

3,954,171

LINEARLY DISPOSED METHOD AND APPARATUS FOR ORIENTING ARTICLES IN A PRE-SELECTED END-TO-END POSITION

Robert K. Chick, Norwich, and Ernest L. Edwards, Essex, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed July 11, 1974, Ser. No. 487,587
Int. Cl.² B65G 47/24
U.S. Cl. 198—246 14 Claims



1. A linear discriminator for orienting articles such as bottles in a pre-selected, end-to-end position, said linear discriminator comprising primary conveyor means moving at a first speed, means for feeding said bottles onto said primary conveyor means, secondary conveyor means having a different relative speed from said primary conveyor means, said secondary conveyor means being disposed adjacent to said primary conveyor means in juxtaposition thereto, discrimination means for sensing the orientation of said articles and article orienting means for uring improperly oriented articles into contact with said secondary conveyor means in response to a signal from said discrimination means, whereby said improperly oriented articles are turned as a result of the speed differential between the two conveyor means.

3,954,172

BAIT BOX

Anthony J. Rinella, 2218 S. 59th Court, Cicero, Ill.

Filed Apr. 7, 1975, Ser. No. 565,768
Int. Cl.² A01K 97/04; B65D 55/14, 85/50
U.S. Cl. 206—1.5 5 Claims

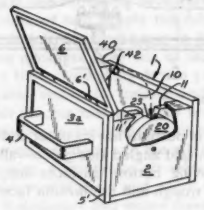
1. A container for transporting and storing material comprising

wall means defining a rectangular container,

said wall means including a pair of oppositely disposed end walls and a pair or oppositely disposed side walls,

said wall means further including a pivotally mounted door movable from a closed position disposed in plane perpendicular to the planes of the end walls and side walls to an opened position permitting access to said container,

lock means operatively coupled to the door automatically permitting said pivotal movement when said door is disposed substantially in a predetermined plane and locking said door when disposed in other planes,



the lock means includes a drum rotatably mounted about an axis and having a weight eccentrically mounted thereon, and

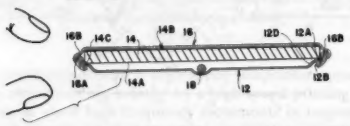
said weight acting to bias said drum to a predetermined position about said axis in all angular orientations of said wall means about said axis.

3,954,173

PACKAGE FOR SENSITIVE PLATES

William E. Eaton, Tequesto, Fla., assignor to Basic Microelectronics, Inc., Lake Park, Fla.

Filed July 2, 1973, Ser. No. 375,450
Int. Cl.² B65D 81/24, 85/48
U.S. Cl. 206—205 3 Claims



1. A storage and shipping package for protecting the surface integrity of a sensitive plate stored therein comprising:

a relatively ductile body having a bottom portion and four side portions together forming a body cavity, said sides each having a continuous angularly disposed wall relative to said bottom portion;

a plate having a plurality of edge portions, said plate edge portions embedded in said body sidewalls whereby relative movement between said plate and said body sidewalls is prevented by the contoured fitting of said plate to said sidewalls;

a covering means disposed about said ductile body top portion and wrapped beneath the sidewall portions holding said plate in position; and

means added within said package for enhancing the wetability of said plate surface for subsequent photo-sensitive coatings on said plate surface, said means coating said plate surface during storage and shipping.

3,954,174

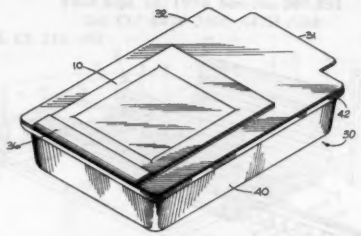
UNITARY TWO-COMPARTMENT PACKAGE FOR STERILE SURGICAL ARTICLES

Robert G. Kraus, Parsippany, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Sept. 23, 1974, Ser. No. 508,143
Int. Cl.² B65D 79/00; A61L 1/00
U.S. Cl. 206—223 3 Claims

1. A unitary two-compartment package for enclosing sterile

surgical articles, wherein the articles in each compartment require sterilization by diverse means, which comprises:



two separate and sealed containers, each defined by walls of sheet material and each of which is permeable to a different means of bacteria sterilization for surgical articles contained within said containers; said containers being permanently joined to each other.

3,954,175

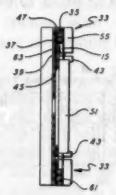
ADJUSTABLE INTEGRATED CIRCUIT CARRIER

Richard Storrs Mason, Escondido, Calif., assignor to The Singer Company, Little Falls, N.J.

Filed July 17, 1975, Ser. No. 596,963

Int. Cl.² B65D *73/02*

U.S. Cl. 206—328 **7 Claims**



1. An adjustable integrated circuit carrier comprising:

a. a master base having a fixed portion and first and second flexible portions capable of being moved apart;

b. first and second movable elements each including a fixed portion and a portion flexibly attached thereto, said flexible portion containing thereon a plurality of retaining means; and

c. said first and second movable elements bonded to said master base, with the fixed portion of said movable element bonded to the fixed portion of said master base and the flexible portions of said movable element bonded respectively to said first and second movable portions of said master base, with the retaining means on said movable elements spaced apart a distance so as to accept an integrated circuit of a predetermined width.

3,954,176

NAIL CARRYING STRUCTURES

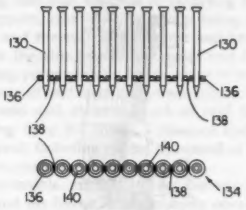
Harry M. Haytayan, Sunnyside Lane, Lincoln, Mass. 01773

Division of Ser. No. 312,665, Dec. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 68,423, Aug. 31, 1970, Pat. No. 3,711,008. This application Aug. 12, 1974, Ser. No. 496,365

Int. Cl.² B65D *85/24*

U.S. Cl. 206—347 **6 Claims**

1. An article of manufacture comprising a shaped strip having the general exterior outline of a number of circular nail flanges connected in series, apertures in said strip adapted to hold nails snugly therein, a mechanically weakened linkage at the point of connection between each pair of adjacent flanges, and a T-nail in each aperture, each flange having a diametrically-extending recess on one side to receive the head of a T-nail so that said head can be disposed flush with said flange.



3,954,177

CONTAINER PACKAGE HAVING INTEGRAL MEANS FOR CARRYING

Clifford C. Faust, Riverside, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 8, 1974, Ser. No. 440,778

Int. Cl.² B65D *5/46, 65/16, 71/00, 85/62*

U.S. Cl. 206—432 **10 Claims**

1. A package comprising at least two containers arranged in a substantially abutting array and a flexible plastic film about and retaining said array of containers, said film having at least two opposite upper end portions having at least two opposed infolded portions, said infolded portions forming integral finger grip pockets for grasping and carrying said package.

3,954,178

CONTAINER COVER

Stanley I. Mason, Jr., 61 River Road, Weston, Conn. 06880

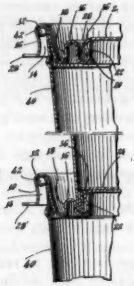
Filed Aug. 2, 1974, Ser. No. 493,881

Int. Cl.² B65D *21/00, 85/62*

U.S. Cl. 206—508 **7 Claims**

1. In a flexible container cover of the type frictionally engaging the rim of a frusto-conical, recessed bottom, disposable container to seal the contents therein, the improvement comprising resilient means for forcefully frictionally engaging the circumferential bottom flange of the recessed bottom of another like container to provide a stable stacking relationship of two or more containers, said means comprising an annular upwardly projecting means, the annular projecting means normally having a diameter slightly greater than the inside diameter of the circumferential bottom wall of the other like container, the annular projecting means deforming and having a diameter less than the inside diameter of the circumferential bottom wall when pressure is applied downwardly on the groove means enabling the annular projecting means to be inserted in telescopic relationship within the recessed bottom, the annular projecting means seeking to return to its normal

diameter upon release of the pressure and when pressure is applied upwardly and thus forcefully frictionally engage the



circumferential bottom wall to provide stable stacking relationship therewith.

3,954,179

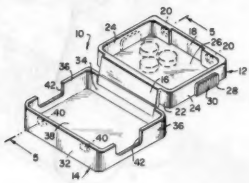
CONTAINER

John G. Warmath, Brooklyn, N.Y., assignor to Deena Packaging Industries, Inc., Long Island, N.Y.

Filed Mar. 20, 1974, Ser. No. 452,911

Int. Cl.[2] B65D *83/04, 43/16, 5/66*

U.S. Cl. 206—528 **6 Claims**



1. A molded integral container formed of a thermoplastic material which comprises:

a body member including a front wall, side walls, and a rear wall, said walls including a first element of a locking means;

a cover member including a front wall, side walls and a rear wall, said walls including a second element of the locking means; and

a connecting member means formed to and integral with said rear walls of said body and cover members whereby said connecting member is compressionally disposed between said rear walls of said bottom member and cover member of said container in a closed assembly to engage thereby said elements of said locking means.

3,954,180

METHOD FOR PACKAGING METAL BARS OR EQUIVALENT, AND MEANS FOR APPLYING THE METHOD

Lauri Aleksander Montonen, deceased, late of Imatra, Finland, and by Raili Montonen, heiress, Terastehdas B-108, 55610 Imatra 61, Finland

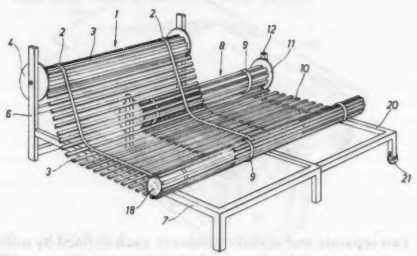
Filed Mar. 14, 1974, Ser. No. 451,056

Claims priority, application Finland, Mar. 16, 1973, 820/73

Int. Cl.[2] B65D *85/54, 75/38;* **B65B** *11/04*

U.S. Cl. 206—525 **6 Claims**

1. A packaging article for packaging elongated objects comprising, in combination, at least two lath mats, each comprising a plurality of spaced laths having a predetermined length and width and arranged in substantially parallel relation, the spacing between adjacent laths being greater than the width of one of said laths, a flexible strip disposed transversely of the length of said laths, means for connecting said strip to each of said plurality of spaced laths, said at least two lath



mats being arranged in interlacing relation such that at least a portion of the length of each lath of a first one of said lath mats is disposed in a space between adjacent laths of a second one of said lath mats.

3,954,181

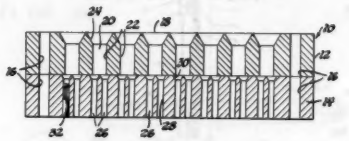
PARTS SORTING GAUGE

Timothy J. Fries, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed July 28, 1975, Ser. No. 599,595

Int. Cl.[2] B07B *13/04*

U.S. Cl. 209—85 **1 Claim**

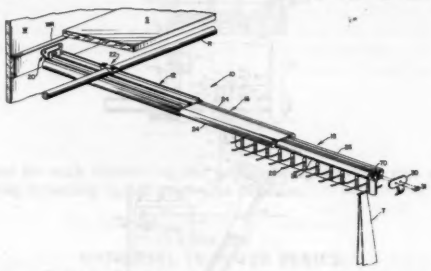


1. A gauge for sorting defective cylindrical parts from satisfactory cylindrical parts, said gauge comprising a parts orienting stratum and a parts sorting stratum disposed beneath said orienting stratum, said orienting stratum having a horizontal parts receiving surface and a plurality of vertical passages extending downwardly therefrom, each of said passages including a straight region for maintaining parts in a substantially vertical orientation, each of said passages further including a tapered region disposed above said straight region and decreasing in diameter from said parts receiving surface to said straight region for guiding parts from said receiving surface into said straight region, each of said tapered regions intersecting other of said tapered regions to minimize the possibility that a part will remain horizontally on said parts receiving surface, said sorting stratum having a plurality of vertical bores disposed beneath each of said passages, each of said bores including a straight section having a diameter substantially identical to the diameter of the straight sections of the other bores for permitting proper cylindrical parts to pass therethrough but to retain cylindrical parts which are bent, which have a radially extending burr, or which are otherwise larger in diameter than said straight section, each of said bores further including a tapered section disposed between the straight region of the associated passage and said straight section of said bore and decreasing in diameter from said passage to said straight section of said bore for guiding parts from said orienting stratum to said straight section of said bore, each of said tapered sections intersecting other of said tapered sections to minimize the possibility that a part will remain in said orienting stratum.

3,954,182
TELESCOPING NECKWEAR RACK

Wilber C. McEvers, 655 Ave. C., S.W., Winter Haven, Fla. 33880

Filed Sept. 18, 1974, Ser. No. 507,051
Int. Cl.[2] A47F 5/08; A47H 1/08
U.S. Cl. 211—94 9 Claims

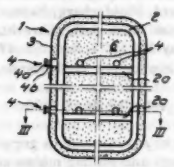


1. A telescoping tie rack comprising:
an elongated support section and at least one telescoping section slidingly interfitted to said support section, said support section and at least one telescoping section being formed of a relatively thin metal body;
a plurality of hanger elements carried by one of said telescoping sections and spaced longitudinally thereof;
runner means attached to one of adjacent ones of said metal sections at the interface therebetween, said runner means being formed of a non-metallic material having a low coefficient of friction with said metal for providing smooth sliding and eliminating binding of said telescoping section; and
means for mounting said apparatus to a vertical wall and a horizontal rod parallel to said wall, said means including a bracket attached to said support section and a hook plate securable to said wall and engagable with said bracket, said support section including a longitudinal T-shaped channel, and said mounting means further including a connector mountable to said rod, including drop-in bolt means engagable with said channel for securing said support section to said rod.

3,954,183
WALL ELEMENT AND AN ELEMENT FASTENING DEVICE

Kurt Lennart Ohlson, Moravagen 27, 161 40 Bromma, Sweden

Filed Jan. 4, 1974, Ser. No. 430,780
Int. Cl.[2] A47F 5/00
U.S. Cl. 211—186 3 Claims

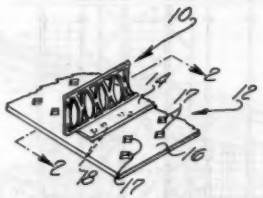


1. A wall element of generally planar configuration comprising a frame and a casing around said frame,
a. said casing having a configuration similar to the configuration of the frame but exceeding the dimensions of said frame thereby leaving a space between said frame and casing, said casing forming the outer surface of the wall element;
b. stiffening means secured to said frame to stiffen said wall element;
c. a plurality of fastening means attached to said frame for securing said wall element to co-acting fastening means on a support, said fastening means being rigidly attached by one end thereof to said frame and having a free end opposite the attached end, some of said fastening means extending perpendicular to the plane of the wall element and others of said fastening means extending in the plane of the said wall element, each of said fastening means extending from the frame a distance such that the free end of such fastening means is located at least flush with the outer surface of the casing; and,
d. a compressible material filling the space between the casing and the frame and displacibly covering the fastening means, said compressible material exposing said fastening means upon being compressed when said fastening means are secured to the co-acting fastening means on the support.

3,954,184
SHELF PARTITION

Walter M. Mendenhall, 8026 28th Ave, North, St. Petersburg, Fla. 33710

Filed Feb. 5, 1975, Ser. No. 547,186
Int. Cl.[2] A47F 5/00
U.S. Cl. 211—184 3 Claims



1. A partition for dividing shelves or the like into distinct compartments, said partition comprising a main body portion, a planar member integral with an edge of said main body portion and extending generally perpendicular thereto, a plurality of retaining means integral with said planar member and designed for insertion into recesses in the shelf for retaining the partition against accidental dislodgment from the shelf, each of said retaining means including a flexible member having a locking surface, camming means carried by said flexible member and including a first surface adapted to engage an edge of said recess as said retaining means is inserted into said recess to urge said flexible member away from the recess until said locking surface clears said recess, and a second surface adapted to engage an edge of said recess to urge the flexible member away from said recess during removal of the partition from the shelf, whereupon after insertion said flexible member is free to return to its original set and said locking surface is aligned with an undersurface of the shelf to resist accidental dislodgment of the partition from the shelf, and after removal said flexible member also returns to its original set to permit subsequent attachment of the partition to a shelf, a plurality of tab members integral with said planar member and designed for insertion into recesses in the shelf, each of said tab members having a generally hook-shaped configuration including a shank and a locking portion integral with the shank and disposed angularly to the shank, each of the locking portions being effective to resist tipping of the partition about the junction of the main body portion and the planar member and to also resist dislodgment of the partition by movement normal to the surface of the planar member, said tab members being spaced further from said main body portion than said retaining members, whereby said partition may be inserted at an angle to the shelf surface with said tab

members leading, and the retaining members will thereafter engage the edges of the recesses.

3,954,185

HYDRAULIC MOTOR SYSTEM

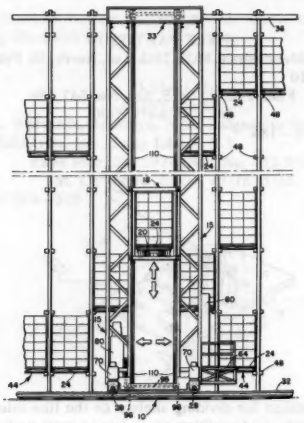
Edward A. Wentz, Gaithersburg, Md., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Division of Ser. No. 198,917, Nov. 15, 1971, Pat. No. 3,792,758, which is a continuation of Ser. No. 840,667, July 10, 1969, abandoned. This application Dec. 11, 1972, Ser. No. 314,160

The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.

Int. Cl.[2] B65J *3/00*

U.S. Cl. 214—1 BB 8 Claims



1. A stacker crane tray mechanism comprising a tray and movable support means therefor, said support means comprising a plurality of pairs of telescopically articulated beams;

one beam pair being attached to said tray and one other beam pair being relatively fixed and with respect to which fixed beam pair all other beam pairs are telescopically movable;

there being beam pairs intermediate said fixed beam pair and the beam pair attached to said tray, and each beam of said intermediate beam pairs having a guide channel extending in to one face thereof and having guide rollers extending from the other face thereof directly opposite the respective channel thereof;

wherein all said beam pairs are telescopically connected by rollers of beam pairs extending into guide channels of immediately adjacent beam pairs;

drive plates secured to respective movable beam pairs for effecting telescopic movement thereof; and each having a central channel with a flange extending laterally on each side of the respective channel and secured to a beam of a respective pair; said channels being nested and having spaces there between and said drive chain means being disposed in said spaces;

said drive plates being sequentially coupled by said drive chain means so that driven movement of a first of said drive plates effects progressively extended movement of the remainder of said drive plates and the respective beam pairs, to drive said tray.

3,954,186

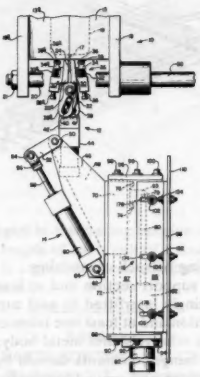
APPARATUS FOR EXTRACTING BLOWN ARTICLES FROM SPLIT BLOW MOLDS

Robert X. Hafele, Baton Rouge, La., assignor to Ethyl Development Corporation, Kansas City, Mo.

Filed Nov. 27, 1974, Ser. No. 527,701

Int. Cl.[2] B65G *65/00;* B29C *7/00*

U.S. Cl. 214—1 BC 7 Claims



1. An apparatus for removing, from a split blow mold, a blown plastic article having a tail extending out of said mold which apparatus comprises:

a. a gripping means for gripping said tail, said gripping means having a first jaw and a second oppositely opposed jaw, said jaws being pivotally connected one to the other and said first and second jaws each carrying a spring ejector means whereby an outward spring pressure is applied to the bottom of said article when said article is extracted from said split blow molds;

b. gripping actuation means attached to said gripping means for closing said gripping means to grip said tail and for opening said gripping means to release said tail;

c. arcuate moving means attached to said gripping actuation means for moving said gripping means in an arcuate direction;

d. longitudinal moving means for moving said gripping means in a longitudinal direction towards and away from said tail; and

e. support means movably attached to said longitudinal moving means.

3,954,187

PIPE BUNDLE KEY

Barend van der Woerd, Muiderberg, Netherlands, assignor to N.V. Machinefabriek Stork-Jaffa, Utrecht, Netherlands

Filed May 15, 1974, Ser. No. 470,119

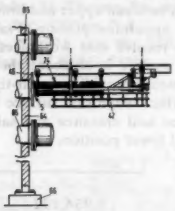
Claims priority, application Netherlands, May 21, 1973, 7307083

Int. Cl.[2] B66F *1/00*

U.S. Cl. 214—1 P 21 Claims

1. A pipe bundle key comprising a gripper adapted to engage a bundle of pipes and pulling means adapted to be coupled with the gripper and to be moved in the pulling direction of the pipe bundle, the gripper being arranged on a main frame which is suspended from a carriage provided with telescopic carrier legs, said pulling means comprising at least two reaction legs adapted to engage a jacket of a bundle of pipes and each reaction leg being displaceably arranged in a subframe in the pulling direction and having at least one series of stop cams coupled with the gripper by means of coupling means engaging the stop cams and adapted to be discoupled,

each subframe being arranged on the main frame so as to be displaceable in a direction transverse of the pulling direction



and for each reaction leg the gripper being provided with a wing extending in said transverse direction.

3,954,188

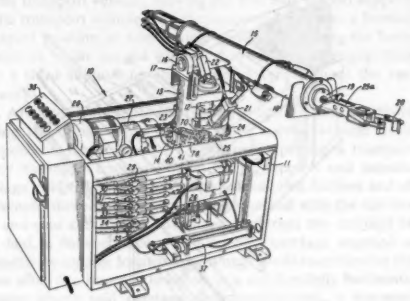
UNIVERSAL TRANSFER DEVICE

Robert F. Boyle, Parchment, Mich., assignor to Prab Conveyors, Inc., Kalamazoo, Mich.

Division of Ser. No. 428,181, Dec. 26, 1973, Pat. No. 3,896,681. This application Nov. 15, 1974, Ser. No. 524,127

Int. Cl.[2] B66C *1/10*

U.S. Cl. 214—1 BC **5 Claims**



1. In a universal transfer device including a structural frame; an upstanding vertical post means affixed to said structural frame; stop plate means integral with said vertical post means and normal to the longitudinal axis of said vertical post means; a pair of radial stop arms rotatably mounted on said vertical post means and detachably secured to said stop plate means peripherally spaced from each other; yoke means rotatably mounted on said vertical post means above said radial stop arms; a pair of spaced stop lugs peripherally mounted on said yoke means and adapted to engage said radial stop arms at a predetermined radian displacement of said yoke means; gripper arm means comprising elongated tubular housing pivotally mounted on said yoke means above said vertical post means and elongated arm member slidably and rotatably received within said tubular housing and extending beyond said tubular housing; jaw means mounted on the outermost end of said arm member; hydraulic yoke motor means mounted on said structural frame and operably associated with said yoke means so as to rotate said yoke means about said vertical post means; hydraulic pivot motor means mounted on said yoke means and operably connected to said tubular housing so as to pivot said tubular housing in a substantially vertical plane; hydraulic gripper arm motor means operably engaging said gripper arm means so as to extend and retract said gripper arm means relative to said tubular housing; hydraulic rotation motor means operably engaging said gripper arm means so as to rotate said gripper arm means in said tubular housing; jaw motor means operably engaged with said jaw means for opening and closing said jaw means, a hydraulic fluid reservoir communicating with each of said hydraulic motor means, prime mover means for circulating said hydraulic fluid between said hydraulic motor means and said reservoir, and control means operably associated with said motor means and energizing said motor means in a predetermined sequence, the improvement which comprises

an intermediate stop means including a base housing mounted on said stop plate means, a peripheral stop arm journaled in said base housing for movement through a predetermined arc from a rest position to an intercept position and adapted to engage one of said stop lugs when at said intercept position, peripheral stop arm motor means engaging the journaled peripheral stop arm for movement through said predetermined arc, and peripheral stop arm control means operably associated with the peripheral stop arm motor mans for energizing said peripheral stop arm motor means.

3,954,189

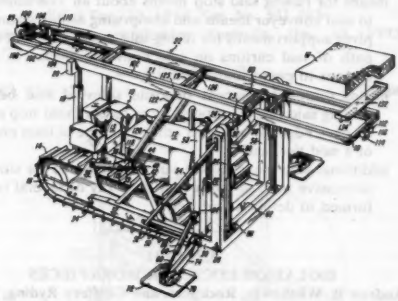
MATERIAL HANDLING APPARATUS

Gail Sherritt, 6121 S. Union Road, Miamisburg, Ohio 45432

Continuation of Ser. No. 403,382, Oct. 4, 1973, abandoned. This application Feb. 14, 1975, Ser. No. 550,034

Int. Cl.[2] B25J *5/06*

U.S. Cl. 214—1 H **15 Claims**



1. Material handling apparatus comprising a platform and means mounting said platform including a pivot means providing an axis about which said platform is movable in a pivotal sense, means for tilting such platform about said pivot means to achieve a generally horizontal position and a generally vertical position thereof and intermediate inclining positions, and different means acting respectively to adjust the position of said pivot means and thereby said platform in a longitudinal sense and in a vertical sense with reference to at least a portion of the mounting means to provide for a continuing balance of said platform and any material thereon in a tilting movement thereof from one position to another.

3,954,190

PALLETIZER

Richard W. Howard, Forest Lake Township, Washington County; Roman J. Weier, and Ronald E. Wyman, both of North St. Paul, all of Minn., assignors to Wyard Industries, Inc., Forest Lake, Minn.

Filed May 6, 1974, Ser. No. 467,371

Int. Cl.[2] B65G *57/24*

U.S. Cl. 214—6 P **13 Claims**

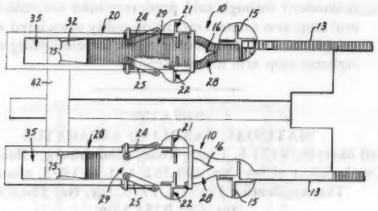
1. A palletizing machine for forming a plurality of cartons in an array to form tiers for stacking on a pallet, said apparatus comprising:

a machine bed,

means on said bed for continuously catching and turning 90° an even number of cartons received in a single continuous file and placing said turned cartons in two rows,

conveyor means on said bed for receiving said cartons in the two rows and moving them along opposite edges of said machine bed,

stop means in the path of said conveyor means for stopping said cartons on said conveyor means and means for rotating said stop means about an axis perpendicular to said conveyor means for selectively rotating said cartons to orient the cartons in a transverse row on said bed from both sides of said bed, said stop means comprising a pair of star wheels each having radial arms for stopping and



rotating as many as two cartons at a time on said conveyor means 90°,

means for raising said stop means about an axis transverse to said conveyor means and comprising motor means and pivot support means for lifting said radial arms out of the path of said cartons on said conveyor means to allow cartons to pass without turning,

means disposed adjacent opposite sides of said bed for forcing said cartons rotated by or passing said stop means on each edge toward each other to define at least one row of a said tier, and

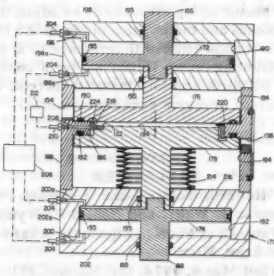
additional stop means along said machine bed for stopping successive rows of boxes until an array of several rows is formed to define a said tier.

3,954,191

ISOLATION LOCK FOR WORKPIECES

Andrew B. Wittkower, Rockport, and Geoffrey Ryding, Manchester, both of Mass., assignors to Extrion Corporation, Gloucester, Mass.

Filed Nov. 18, 1974, Ser. No. 524,354
Int. Cl.² C23C *13/08*
U.S. Cl. 214—17 B **10 Claims**



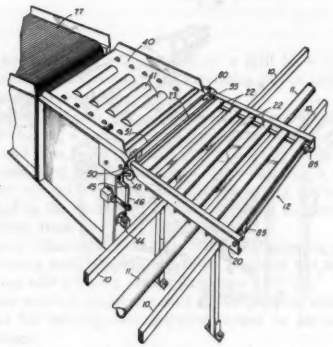
1. An isolation lock through which a workpiece item can move in a path between first and second regions at different pressures, the lock comprising a housing having an upper item entrance and a lower item exit at opposite sides of the housing, a movable member within said housing defining an item-receiving surface disposed substantially in a plane which lies at a constant acute angle to the horizontal regardless of its position to enable gravity movement of said workpiece over said surface, said member movable to translate said item-receiving surface between upper and lower positions in which, respectively, the uppermost portion of said surface is adjacent the entrance to receive said workpiece and the lowermost portion of said surface is adjacent the exit to deliver said workpiece and means providing an air-tight seal between said exit and said surface when said surface is in said upper position and between said entrance and said surface when said surface is in said lower position.

3,954,192

MEANS FOR LOADING CARS IN A RAILROAD TRANSPORTATION SYSTEM

Max Welton Watts, Tiger, Ga., assignor to Aid Corporation, Clayton, Ga.

Filed Mar. 25, 1974, Ser. No. 454,445
Int. Cl.² B65G *67/02*
U.S. Cl. 214—38 BB **7 Claims**



1. A cargo loading system comprising a car; cargo conveying means mounted on said car; transmission means mounted on said car for transmitting driving force to said cargo conveying means; drive means positioned at a cargo loading station; and gear coupling means for coupling said drive means with said transmission means when said car is located at said loading station;

said drive means including a drive gear; said transmission means including a transmission gear; said coupling means including a coupling gear adapted to mesh with said drive gear and said transmission gear, said coupling means further including means for revolving said coupling gear at least partially about the axis of said drive gear in mesh with said drive gear whereby the drive gear may function as a sun gear and the coupling gear as a planet gear;

said cargo loading system further comprising cargo stop means mounted to said car for movement between a position inhibiting conveyance of cargo by said cargo conveying means onto and off said car and a position permitting conveyance of cargo by said cargo conveying means onto and off said car, and cargo stop actuating means including a camming surface mounted to said revolving means.

3,954,193

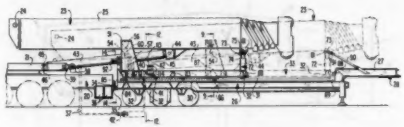
APPARATUS AND METHOD FOR TRANSFERRING A CRANE BOOM ASSEMBLY FROM A CRANE CARRIER TO AN INDEPENDENT TRANSPORT VEHICLE

Reginald P. Whittingham, St. Thomas, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Feb. 7, 1975, Ser. No. 548,149

Int. Cl.² B65G 67/02

U.S. Cl. 214—38 R 20 Claims



1. A method of transferring a crane boom from a carrier vehicle to an independent transport vehicle comprising the steps of lowering the crane boom while attached to said carrier vehicle to a substantially horizontal position above said transport vehicle and engaging the lowered boom with a first support on the transport vehicle, disconnecting the boom from the carrier vehicle and thereafter engaging and lifting the boom free of the carrier vehicle by means of a second support on the transport vehicle, moving the first and second supports on the transport vehicle with the supported boom to a forward transport position on said vehicle and then lowering the boom in relation to the second support into supportive engagement with a third support on the transport vehicle near the rear thereof.

6. Apparatus in combination with a crane boom for transferring the crane boom from a crane carrier vehicle to an independent boom transport vehicle comprising a transport trailer having a tracked bed, a boom support and transfer carriage guidingly mounted on the tracked bed for fore and aft movement thereon, power means connected with the tracked bed and said carriage to advance and retract the carriage on said bed, a forward boom rest on said carriage adapted to supportively engage locator means near the forward end of the boom after the boom is lowered to a substantially horizontal position above said carriage and tracked bed, a rearward boom rest on said carriage including an elevatable cradle means adapted to engage and lift the rear portion of the boom after separation from the carrier vehicle and after said supportive engagement with said forward boom rest, and means to lock said carriage in an advanced position on said transport vehicle.

3,954,194

MATERIAL GRASPING APPARATUS

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 15, 1974, Ser. No. 514,503

Int. Cl.² B60P 1/54; B66C 1/00

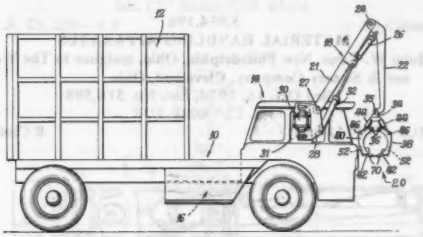
U.S. Cl. 214—75 H 10 Claims

1. Material grasping apparatus especially adapted for grasping and moving irregularly shaped, fragile material, comprising the combination of:

a pair of jaws pivotally connected to each other and having confronting concave material receiving cavities, each said jaw having spaced, rigid end members and a flexible, deformable, resilient material engaging element extending between and connected to said end members to at least partially close the respective material receiving cavity, each said element being substantially unbacked whereby said elements may deform to the shape of a fragile, irregularly shaped object when said jaws are closed thereon; and

power means for selectively opening and closing said jaws.

5. A refuse collecting vehicle incorporating the material grasping apparatus of claim 1 including a vehicle frame having a refuse receiving cavity; a boom mounted on said frame; said



material grasping apparatus of claim 1 being mounted on said boom; and further power means for said boom for moving said boom so that said material grasping apparatus may grasp material and move the same to said refuse receiving cavity.

3,954,195

LEVER SYSTEMS PARTICULARLY USEFUL FOR FURNITURE

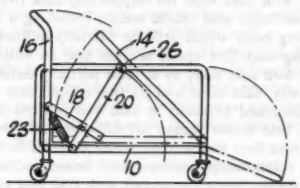
Francis Warwick Deuchar, 7 Beryl St., Croydon, Victoria, Australia

Filed Dec. 10, 1974, Ser. No. 531,493

Claims priority, application Australia, Dec. 11, 1973, 5945/73

Int. Cl.² B60P 1/00

U.S. Cl. 214—82 2 Claims



1. A lever system in a goods trolley, shopping jeep or the like comprising a frame, a pivotal side wall member having a normal upright position and pivotally mounted on the trolley frame for forward movement, a liftable base member pivoted to the frame at its forward end, a lift member pivotally mounted on the frame and engageable with the liftable base member, link means pivotally mounted on the side wall member at one end and having the other end free, latch means including a notch intermediate the link means and a pin on the lift member, said latch means interconnecting the link means and said lift member upon relative pivotal movement of said side wall member, said side wall member acting as a lever member to move said lift member to engage and lift said base member about said forward pivot to assist in removal of goods from trolley upon movement of the side wall member to its normal upright position.

2. An invalid chair for assisting a seated person into a standing position comprising a frame, a pivotal back rest means having a normal upright back rest position pivotally mounted on the chair frame and movable to a forward position, a liftable seat member pivoted to the frame at its forward end, a lift member pivotally mounted on the frame and engageable with the liftable seat member, link means pivotally mounted on the back rest means, latch means interconnecting said lift member with the link means upon forward movement of the back rest

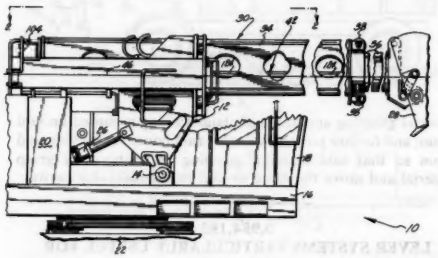
means, said back rest means acting as a lever arm to move said lift member and thereby lifting said liftable member to an elevated position to assist a seated person to a standing position upon movement of the back rest means from its forward to its normal upright position.

3,954,196

MATERIAL HANDLING APPARATUS

John W. Gano, New Philadelphia, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Oct. 15, 1974, Ser. No. 514,598
Int. Cl.² E02F 3/38
U.S. Cl. 214—141 8 Claims



1. A material handling apparatus comprising a base, a longitudinally extending first boom section having axially inner and outer end portions, said outer end portion of said first boom section including surface means for defining a first opening, said inner end portion of said first boom section including surface means for defining a second opening, a second boom section telescopically disposed within said first boom section and extending through said first opening, cradle means connected with said base for supporting said first and second boom sections, said cradle means including a longitudinally extending body which at least partially defines a cavity for receiving said first boom section and an end portion connected with said body to at least partially define one end of said cavity, said inner end portion of said first boom section being disposed adjacent to said end portion of said cradle means, first motor means for effecting axial movement between said first and second boom sections to vary the telescopic relationship between said boom sections, said first motor means being connected with said end portion of said cradle means and extending through said second opening in said first boom section into engagement with said second boom section to transmit axial thrust forces between said second boom section and said cradle means independently of said first boom section, and second motor means disposed between said inner end portion of said first boom section and said end portion of said cradle means for effecting rotational movement of said first and second boom sections relative to said cradle means.

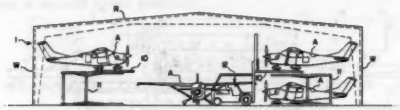
3,954,197

METHOD OF STORING AIRCRAFT

Charles W. Dean, 2942 Palm Ave., Fort Myers, Fla. 33901

Division of Ser. No. 175,514, Aug. 27, 1971, Pat. No. 3,756,419. This application Apr. 17, 1973, Ser. No. 351,951
Int. Cl.² B65G 47/00; E04H 6/06
U.S. Cl. 214—152 4 Claims

1. A method of storing a plurality of aircraft on individual and portable open frame means placed in a hangar facility, with aircraft supporting pallet means liftable onto and off of said frame means, and lift means for lifting said pallet means and an aircraft supported thereon onto and off of said frame means, wherein the frame means has a bottom and a top, with the bottom having means for supporting the frame means in an upright position on the floor of the hangar facility, and wherein the frame means is constructed so that it is capable of accommodating a first winged aircraft therewithin between the top and bottom thereof with the wings of the aircraft extending laterally outwardly from opposite sides of the frame means, and wherein the top of the frame means is capable of supporting a pallet means with a second winged aircraft thereon in superposed, spaced relationship above the first aircraft, comprising the steps of: placing and supporting a first winged aircraft in a first frame means between the top and bottom thereof with the wings of the aircraft projecting laterally outwardly from opposite sides of the frame means; placing



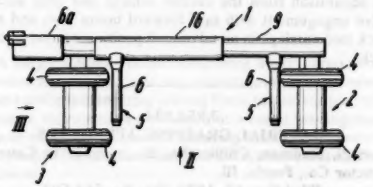
and supporting a second winged aircraft on top of said pallet means and lifting the pallet means and second aircraft onto the top of the frame means and supporting them thereat in superposed, spaced relationship above the first aircraft and with the wings thereof projecting laterally outwardly above the wings of the first aircraft; and placing and supporting at least one additional winged aircraft laterally alongside the first frame means on the same level as one of said first and second aircraft and in closely spaced relation thereto with a wing of the additional aircraft disposed in overlapped relationship with an adjacent wing of each of the first and second aircraft.

3,954,198

LIFT TRUCK FOR VEHICLES

Franz X. Sedelmayer, Galssacher Str. 5, 8 Munich 70, Germany

Filed Sept. 20, 1974, Ser. No. 507,770
Claims priority, application Germany, Oct. 3, 1973, 2349717
Int. Cl.² B60B 29/00
U.S. Cl. 214—333 9 Claims



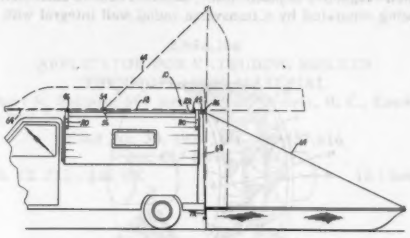
1. A lift truck for vehicles, comprising a telescopic support, two spaced axles projecting from one side of said support and two lifting arms projecting from said one side of said support between and substantially parallel to said axles, said telescopic support including a piston/cylinder unit including a power piston and a first cylinder movable relative to each other, and a second cylinder, said first and second cylinders being movable relative to each other, said first cylinder and said second cylinder each supporting one of said axles and one of said lifting arms, whereby said lifting arms can be urged aginst a vehicle wheel by retracting the telescopic support below the vehicle wheel axle.

3,954,199

BOAT HANDLING APPARATUS FOR STOWING BOATS ABOARD OVERLAND VEHICLES

Russell E. Grove, 5679 N. Van Ness Blvd., Fresno, Calif. 93705

Filed Apr. 24, 1975, Ser. No. 571,421
Int. Cl.² B60R 9/00
U.S. Cl. 214—450 11 Claims



1. In a boat handling apparatus particularly suited for use in stowing boats aboard overland vehicles, the improvement comprising:

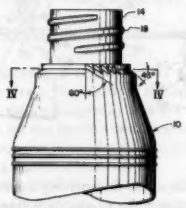
first means including a first windlass adapted to be mounted atop an overland vehicle and characterized by a first hoisting line adapted to be connected to the bow of a boat positioned in spaced relation therewith and below the level thereof for advancing the boat along an arcuate path into a received relationship atop said vehicle, and second means including a second windlass adapted to be mounted atop said vehicle in juxtaposition with said first means and characterized by at least a second hoisting line adapted to be connected to the stern of the boat for advancing the boat along a linear path into a stowed relationship with said vehicle.

3,954,200

MOLDED CONTAINER

Wilburn C. Willis, Hagerstown, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 14, 1975, Ser. No. 567,620
Int. Cl.² B65D 1/02, 11/04
U.S. Cl. 215—31 4 Claims



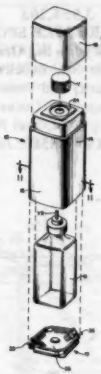
1. A molded container having a cylindrical neck portion with a mouth opening therein and at least two adjacent teeth projecting upwardly from the exterior surface of the container near said neck portion for engagement by at least one mating tooth on a closure adapted for closing the container mouth opening, each such container tooth having a locking surface thereon in a plane disposed generally radially through the vertical axis of the container and an outwardly-upwardly facing cam surface thereon in a plane angled, from the outer edge to the inner edge of such camming surface, inwardly toward the vertical axis of the container and angled with respect to the plane of said locking surface.

3,954,201

HOUSING FOR CONTAINER

Efrem M. Ostrowsky, Highland Park, Ill., and Anthony F. Schepis, Pelham Manor, N.Y., assignors to VCA Corporation, Baton Rouge, La. and Chanel, Inc., New York, N.Y.

Filed Sept. 17, 1975, Ser. No. 614,008
Int. Cl.² B65D 7/00, 45/16
U.S. Cl. 220—4 F 24 Claims



1. A housing for holding a container therein which housing comprises:

a. an elongated, hollow body having an open bottom, said holding body being dimensioned such that said container is fittable therein;

b. engaging means attached to the interior of said hollow body and adjacent to said open bottom;

c. a removable bottom wall cooperative with said hollow body for closing off said open bottom; and

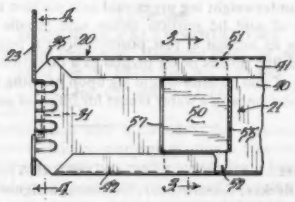
d. latching means cooperative with said engaging means to removably hold said bottom wall to said hollow body, said latching means being attached to said bottom wall by torsion means whereby said latching means are in torsion when said latching means is in cooperation with said engaging means.

3,954,202

DRAWER DIVIDER SYSTEM

Russell E. Petrick, Park Ridge, Ill., assignor to Bretford Manufacturing, Inc., Schiller Park, Ill.

Filed May 20, 1974, Ser. No. 471,510
Int. Cl.² B65D 25/06; B42F 17/12
U.S. Cl. 220—22.1 4 Claims



1. A drawer divider system including, a generally planar divider member extendable upright between a pair of opposed drawer surfaces to partition a drawer interior, a generally upright follower block extending laterally from said divider member to back up material stored in a drawer, and interengaging means on said follower block and divider member guiding said follower block for sliding linear movement lengthwise of said divider member, said interengaging means

including a pair of in-turned flanges extending along the length of said divider member defining a pair of elongate guide channels at the top and bottom of the divider member and a pair of tabs on said follower block positioned one in each of said guide channels, at least one of said tabs having a configuration so as to frictionally engage its guide channel to frictionally hold the follower block at a desired location along the length of the divider member.

3,954,203

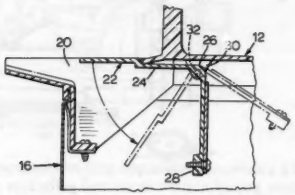
ELECTRIC KETTLE SPOUT FLAP

Morris E. Jorgenson, 67 Bythia St., Orangeville, Ontario; Paul B. Sheldon, 48 Tupper St., Brockville, Ontario; Jack A. Sherman, 23 Forest Park, and Peter S. Wardell, 63 Rustic Crescent, both of Orangeville, Ontario, all of Canada

Filed June 27, 1974, Ser. No. 483,891

Int. Cl.² B65D *51/04*

U.S. Cl. 220—334 **1 Claim**



1. In a kettle used for heating and boiling liquids, spout flap means mounted in a working relationship in the interior of said kettle, said kettle being formed of a bowl shaped vessel, which has a circular lid portion secured thereto at the upper periphery of said vessel, said lid portion being of a shallow truncated conical shape at the periphery terminating in a flat circular surface at the center of said lid portion, said lid having a handle means and spout means formed integrally therein, said handle means and spout means being axially aligned on a diameter of said lid portion, said spout means being molded on the periphery of said lid, said spout means having a generally flat horizontal top perimeter in said lid of such size that said kettle may be easily filled from a standard kitchen water faucet, said flap means is generally L-shaped in cross-section with one leg thereof comprising a blocking portion and an arm portion, said blocking portion having a perimeter which fits closely in said top perimeter of said spout means to close the part of said top perimeter immediately forward of the handle, said arm portion being planarly offset downwardly from said blocking portion, the other leg of said flap means comprising a counterweight leg, said flap means being pivotally connected to the underside of said lid portion at the junction of said legs so said counterweight leg urges said arm portion to abut said underside of said lid portion below said handle when said kettle is in its normal at rest position or in a pouring disposition, said flap means being pivotal in a direction counter to the urging of said counterweight leg upon pressing against said blocking portion with a water faucet for filling of said kettle.

3,954,204

CELL WHEEL FOR SINGLING AND SEPARATING SEEDS

Reinhard Becker, Gieselwerder, Germany, assignor to Deere & Company, Moline, Ill.

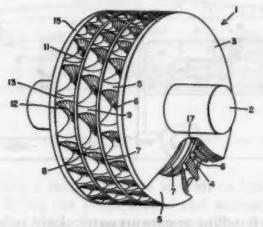
Filed Mar. 4, 1974, Ser. No. 448,090

Claims priority, application Germany, Mar. 6, 1973, 2310979

Int. Cl.² B23Q *7/04*

U.S. Cl. 221—211 **2 Claims**

1. A cell wheel for singling and separating seeds, comprising a multi-piece annular structure having a plurality of cell elements and a plurality of flat disks, one disk being interposed between elements of a neighboring pair and the axially outermost disks being cover disks, the outside diameter of said structure being substantially uniform throughout its axial dimension, each cell element having a plurality of uniformly angularly spaced identical cells of generally radially inwardly tapering configuration leading respectively to interior openings smaller than the smallest seed to be singled and separated with the interior openings being axially offset inwardly from their respective adjacent disks, adjacent cells in each element being separated by a transverse radial wall integral with the



respective element and each cell having a radial innermost portion tapering outwardly from its interior opening and a radially outermost portion that is radially outwardly of its innermost portion and opening axially at its opposite sides to and closed by the respective adjacent disks so that the radial outermost portions of the cells in each element are separated from the cells in the next adjacent element by the intervening disk and the cells in the axially outermost elements are closed by the respective cover disks, and the cells in each element being circumferentially offset from the cells in the next adjacent element.

3,954,205

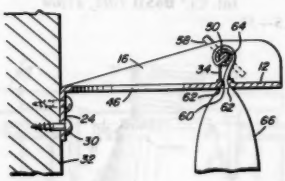
TOOTHPASTE DISPENSER

Shelly R. Williams, P.O. Box 343, Goodlettsville, Tenn. 37072

Filed Feb. 28, 1975, Ser. No. 554,391

Int. Cl.² B65D *35/34*

U.S. Cl. 222—100 **7 Claims**



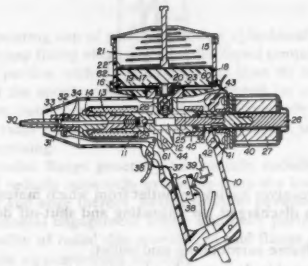
1. A toothpaste dispenser comprising a generally horizontal panel constructed of stiff but bendable material and including opposite side marginal portions bent upwardly at generally right angles relative to said panel and along generally parallel bend zones, a pair of aligned bores formed in said opposite side marginal portions spaced above the intermediate portion of said panel extending between said opposite side marginal portions, a winding shaft journaled in and extending between said bores, said shaft including anchor means for anchoring the closed end of a collapsible tube to said shaft for winding of said tube thereon, said intermediate panel portion having a slit formed therethrough extending generally along a diametric plane of said shaft disposed generally normal to said intermediate panel portion, the edge portions of the intermediate panel portion defining the opposite sides of said slit being upwardly deflected, at least slightly, toward said shaft and

thereby defining a narrow slot therebetween with the sides of the slit defining edge portions of said intermediate panel portion remote from said shaft smoothly convexly curving into said slot whereby to define an entrance throat therebetween, said bores being defined by the greater width ends of keyhole slots formed in said panel whose lesser width ends extend across said fold zones and into said intermediate panel portion toward each other, the opposite ends of said slit opening into the adjacent ends of the lesser width ends of said keyhole slots.

3,954,206
APPLICATOR FOR EXTRUDING MOLTEN THERMOPLASTIC MATERIAL

Albert R. Salonen, 560 Baxter Ave., Victoria, B. C., Canada (V8Z 2G7)

Filed Jan. 30, 1974, Ser. No. 437,816
Int. Cl.² B27G *11/02*
U.S. Cl. 222—146 HE **10 Claims**



1. An applicator for extruding molten thermoplastic material comprising:

a body portion;

a member mounted on said body portion and provided with an elongated passageway extending therethrough;

means for heating said member;

a nozzle carried by said member and provided with a discharge opening communicating with one end of said passageway;

a valve means normally closing said one end of the passageway;

an inlet opening into said passageway at a location toward the other end thereof;

means for supplying molten plastic material into said inlet opening;

means for inducing a reduction in pressure in said inlet opening to draw the molten material from said supply means into said passageway and for inducing an increase in pressure on the molten material in said passageway to urge the material toward said nozzle;

said supplying means comprising

a receptacle mounted on said applicator at a location adjacent said inlet opening for receiving and containing in solid form the plastic material that is to be melted,

means for applying heat to the inner side of said receptacle at the region of said base to melt a portion of the material contained in said receptacle and for limiting the melting of the material within said receptacle to the inside base region thereof, comprising means for thermally insulating said inside base region from the walls of said receptacle to facilitate the maintenance of a difference in temperature between said inside base region and said walls, and heat-conductive means providing a heat conducting path between said inside base region and said member, including means for controlling the heat conductivity of said path to regulate the rate of thermal conduction from said member to said base region;

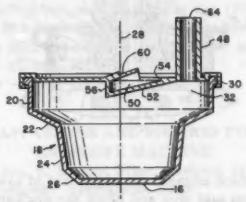
means for urging the plastic material contained in said receptacle toward said inside base region and being operable to effect establishment of a layer of molten plastic material adjacent said inside base region as the plastic material is melted by heat therefrom, and

duct means communicatively connecting said inside base region to said inlet opening for conveying the molten material from said inside base region to said inlet opening.

3,954,207
DOSAGE DISPENSER

Paul W. Gerding, Fort Wayne, and Donald E. Head, Columbus, both of Ind., assignors to Paul W. Gerding, Fort Wayne, Ind.

Filed Apr. 1, 1974, Ser. No. 456,454
Int. Cl.² B65D *37/00*
U.S. Cl. 222—212 **9 Claims**



1. A dosage dispenser comprising a closed container having a top, bottom and upstanding side walls, said side walls including a plurality of wall sections angularly disposed with respect to adjacent ones thereof, said sections include a plurality of joined and generally conical sections, the corresponding cross-sectional dimensions of said sections decreasing in a direction from said top to said bottom walls, said dispenser being manually collapsible between a rest condition with said top and bottom disposed in generally parallel, spaced-apart relationship and a substantially fully collapsed condition in response to pressure on said top and bottom, said wall sections defining obtuse angles with respect to each other when said container is in said rest condition, said wall sections being folded to positions disposed and at acute angles with respect to one another and said top and bottom being adjacently disposed when said container is in said collapsed condition whereby both flowable and viscous fluids are substantially fully evacuated therefrom, and a tube connected to said container and communicating with the interior thereof, said tube also being collapsible to prevent the transmission of the contents of said container through said tube.

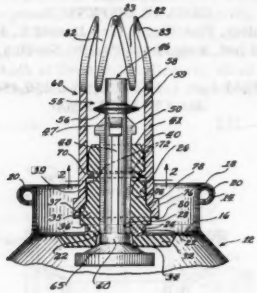
3,954,208
DISPENSER VALVE STRUCTURE

Roy N. Brill, 400 Park Ave., Highland Park, Ill. 60035

Filed Jan. 8, 1975, Ser. No. 539,402
Int. Cl.² B65D *83/14*
U.S. Cl. 222—402.23 **8 Claims**

1. In combination with a container for dispensing liquids under pressure, said container including a closure having an opening therethrough, a resilient tubular plug extending through said opening and having a flange engaging the undersurface of said closure and an annular outwardly extending shoulder above said flange, with the underside of said shoulder engaging the container closure to secure said plug to said closure, said plug having a valve seat on its inner side, said plug having a tubular portion providing a bore, a separate nozzle having a tubular body, said nozzle positioned on said tubular portion of said plug, with the tubular body portion of the nozzle surrounding the tubular portion of the plug and the lower end of the body portion of the nozzle extending exteri-

orly around the plug, said nozzle formed to provide a plurality of spaced slots on the outer end thereof, the body of said nozzle and said tubular portion of said plug having cooperating means engaging each other to retain said nozzle on said plug, said cooperating means positioned respectively on the interior of the body of the nozzle and on the exterior of the tubular portion of the plug and intermediate the top and bottom of said nozzle body and said tubular portion of said plug, a valve stem unit including a stem positioned within said tubular plug, said stem being provided at its inner end with a



valve head which engages the valve seat of said plug to close the entrance to said plug and block the discharge of the pressurized liquid, said valve stem having a plurality of spaced vertically extending ribs providing passage spaces between the stem and said bore, said stem having a deflector means positioned above said ribs, said deflector means causes the discharged material to be deflected in a generally radial direction to pass between the slots in said nozzle, and said stem having an outwardly extending projection formed at the top of said ribs below said deflector means.

3,954,209

INJECTION NOZZLE FOR PLASTICS MATERIALS HAVING CENTERING FOR OUTLET VALVE

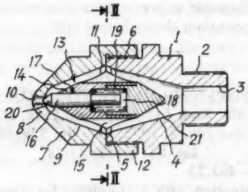
Louis Maurice Ramond, 28 rue de la Baume, 42160 Andrezieux, France

Filed June 3, 1975, Ser. No. 583,165

Claims priority, application France, June 4, 1974, 74.19874

Int. Cl.² B29F 1/03

U.S. Cl. 222—496 **4 Claims**



1. An injection nozzle for plastics material comprising a rear tubular body, a hollow front body defining a nozzle orifice at one end and detachably secured to said rear tubular body at the other end, an elongate body within said rear tubular body and said hollow front body, at least three radially extending arms on said elongage body cooperating with an annular V-shaped groove formed by chamfers in engaging surfaces of said rear tubular body and said hollow front body to axially fix and radially center said elongate body and a closure member slidable in said elongate body and biased to close said nozzle orifice in said hollow front body.

3,954,210

UNLOADING AND SHUT-OFF DOOR

Randal Luscombe, R.F.D., Blackwater, Mo. 65322

Continuation-in-part of Ser. No. 265,823, June 23, 1972, abandoned. This application Oct. 15, 1974, Ser. No. 514,491

Int. Cl.² B67D 3/00

U.S. Cl. 222—561 **5 Claims**

1. In a receiver having an outlet from which material in the receiver is discharged, an unloading and shut-off door comprising:

a door frame surrounding said outlet;

a reciprocable door member having a pair of opposed side margins and presenting opposed, inwardly and outwardly facing surface; and

track structure mounting said door member in said frame for sliding movement in the track structure between a closed position sealing said outlet and an open position permitting discharge of said material therefrom,

said structure including an inner rail and an outer rail presenting a pair thereof at each of said margins of the door member receiving the respective margin therebetween and engageable with corresponding surfaces of said door member,

each pair of rails extending at an angle to the horizontal and having means cooperating with the inner rail to define a passage along the rails and the respective margin for receiving material entering the track structure at said margin and conveying such material away from the track structure by gravity flow through said passage, whereby to provide a self-cleaning door track to prevent the door member from freezing in either position,

each pair of rails including an elongated, transversely generally U-shaped track component and an elongated, flat track component presenting said outer rail, said U-shaped component having a bight and a pair of spaced longitudinal flanges, one of said flanges presenting said inner rail and being inset from the edge of the door member defined by the respective margin and in engagement with said inwardly facing surface exclusively at a line of contact therewith extending generally along the path of sliding movement of said door member, said flat component engaging said outwardly facing surface over a substantial area of the respective margin outside of said line of contact, said bight and the other of said flanges of the U-shaped component presenting said cooperating means,

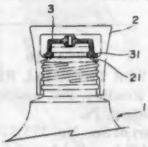
each pair of rails having an opening communicating the associated passage with said receiver at the lower end of the passage, whereby material entering the track structure at the side margins of the door member returns to the receiver through said passages to prevent leakage when the door member is in its closed position.

3,954,211

POURING CAP FOR LIQUID CONTAINER

Shinichi Araki, Sakura, Japan, assignor to The Lion Fat and Oil Co. Ltd., Tokyo, Japan

Filed Sept. 6, 1974, Ser. No. 503,835
Claims priority, application Japan, Sept. 11, 1973, 48-106984[U]
Int. Cl.² B67D 3/00
U.S. Cl. 222—562 2 Claims



1. A pouring cap of generally hollow cylindrical configuration for snap fitting engagement with a liquid container having a spout portion with a larger diameter than its neck region adjacent the spout portion and also adapted for engagement within an outer container cap having an inwardly extending annular ridge provided on the inner wall thereof, said pouring cap comprising:

an annular flange generally horizontally radially inwardly and radially outwardly extending from the lower peripheral end edge thereof, having its inner peripheral end for horizontal engagement within said neck portion; and

a plurality of radial slits provided in said flange around the whole circumference thereof,

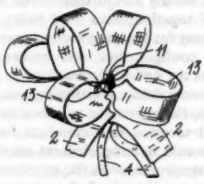
said flange having a sufficient radial width of an extent such that said flange, when unflexed, has the diameter of the outer periphery thereof larger than the innermost radial extent of said annular ridge so that said flange, when the pouring cap is fitted within the outer cap, is flexibly bent down to permit said flange to abut said annular ridge of the outer cap and rest retained thereon, and when the outer container cap is removed from the liquid container and is outwardly flexed about the lower peripheral end edge of the pouring cap to have the pouring cap left alone on the spout portion of the container in engagement therewith.

3,954,212

METHOD FOR MAKING RIBBONS CURLABLE IN A COCKADE FASHION

Ernesto Bolis, Via Ravasio, 1, Ponte S. Pietro (Bergamo), Italy (24036)

Filed Jan. 23, 1975, Ser. No. 543,510
Claims priority, application Italy, July 23, 1974, 2911/74
Int. Cl.² A41H 43/00
U.S. Cl. 223—46 2 Claims



1. A method for making ribbons which can be curled up in various aesthetically pleasing configurations, the method comprising the steps of:

unwinding from at least one ribbon supply roll at least one ribbon;

feeding said ribbon in a given feed direction in a stepwise fashion by predetermined steps through a set of guide elements;

simultaneously unwinding a tape from a tape supply roll;

feeding said tape in said feed direction in a stepwise fashion by the same predetermined steps as for the ribbon;

passing said tape in superimposed relation to said ribbon between said set of guide elements so that the tape lies longitudinally of the ribbon and at the central area thereof;

feeding said ribbon along with the tape to a shearing area;

laterally shearing a portion of both lateral sides of the ribbon to define two opposed roundish side cuts;

feed said sheared ribbon along with said superimposed tape to a stitching area;

closing a metal ring around said ribbon and tape at the center of each sheared area, in timing relationship with the stepping of said ribbon, so that upon being closed about said ribbon said ring holds the ribbon and tape together in a loose sliding relationship; and

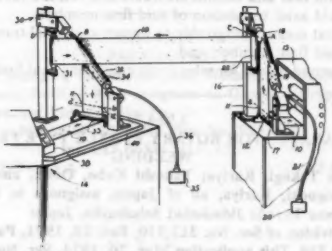
transferring said ribbon, tape, and rings so assembled to a final take-up roll.

3,954,213

TURN BAR APPARATUS AND METHOD FOR WEB FED ENVELOPE MACHINE

Egil A. Andersen, E. Dennis, Mass., assignor to United States Envelope Company, Springfield, Mass.

Filed Dec. 23, 1974, Ser. No. 535,295
Int. Cl.² B65H 23/32
U.S. Cl. 226—7 8 Claims



7. Method for continuously introducing a web into cutting means of an envelope-making machine, said machine having a center line, a movable swivel plate and a pivot point about which said plate is adjustable, comprising:

a. advancing a web along a first path to first horizontal directing means;

b. directing the web to first turnover means for turning the web to edgewise orientation;

c. turning the web to an edgewise orientation;

d. advancing the web on its edge to vertical directing means; said vertical directing means being positioned on the swivel plate of the envelope-making machine;

e. directing the web to second turnover means for turning the web to flat orientation, said second turnover means being positioned on the swivel plate of the envelope-making machine;

f. advancing the web to second horizontal directing means said horizontal means being positioned on the swivel plate of the envelope-making machine;

g. directing the web into cutting means of the envelope-making machine along a second path, said second path being at an angle to said first path and said second path being at a desired angle in relationship to the center line of the envelope-making machine, said second path estab-

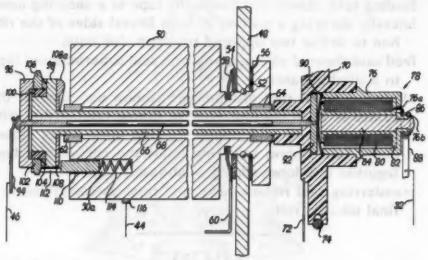
lished by adjusting the swivel plate to a desired position by pivoting said plate about a pivot point said pivot point lying on the center line of the machine.

3,954,214

FILM PROJECTOR

Miklos Von Kemenczky, Greenbrook, N.J., assignor to Paul Guilden, New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,799
Int. Cl.² G03B 1/24
U.S. Cl. 226—76 26 Claims



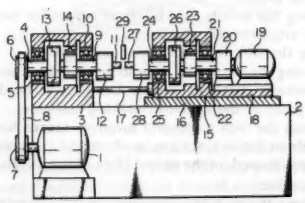
1. In combination, in a film projector:
a. drive means continuously operative during projector use;
b. first and second members each connected to said drive means and rotated thereby about a common axis at common rotational speed, said first and second members being axially spaced from one another, said first member being supported for axial translation toward said second member;
c. film advancing sprocket means supported axially between said first and second members and rotated thereby upon said axial translation of said first member;
d. first means energizable to impart said axial translation to said first member; and
e. second means for selectively energizing said first means.

3,954,215

APPARATUS FOR ROTARY BI-AXLE TYPE FRICTION WELDING

Nobuo Takagi, Kariya; Takeshi Kubo, Oobu, and Takashi Takiguchi, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Division of Ser. No. 212,910, Dec. 28, 1971, Pat. No. 3,819,339. This application Mar. 20, 1974, Ser. No. 452,818
Claims priority, application Japan, Dec. 30, 1970, 45-123068
Int. Cl.² B23K 27/00
U.S. Cl. 228—2 22 Claims



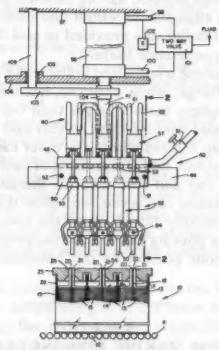
1. In an apparatus for friction welding of the type including a machine bed, a main spindle supported on the machine bed for holding a first workpiece to be welded, a drive source for rotating said main spindle at a given speed, a rotatable subordinate spindle supported on said machine bed so as to be opposite said main spindle on a common axis, said subordinate spindle being adapted to hold a second workpiece to be welded to said first workpiece, and means for moving one of said main and subordinate spindles toward the other along said common axis to bring the second rotatable workpiece into contact with the first workpiece under an axial thrust;
the improvement comprising means for producing a signal responsive to a change of a physical value which changes with an increase of the amount of upsetting of said workpieces during welding from the initiation of the friction welding, and means for disconnecting said main spindle from said drive source in response to said signal from said signal producing means, thereby releasing said first workpiece to rotate freely with said second workpiece.

3,954,216

APPARATUS FOR THERMAL RELAY WELDING

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 395,528, Sept. 10, 1973, Pat. No. 3,861,575, which is a division of Ser. No. 184,338, Sept. 28, 1971, abandoned. This application Jan. 11, 1974, Ser. No. 432,545
Int. Cl.² B23K 3/02
U.S. Cl. 228—51 15 Claims



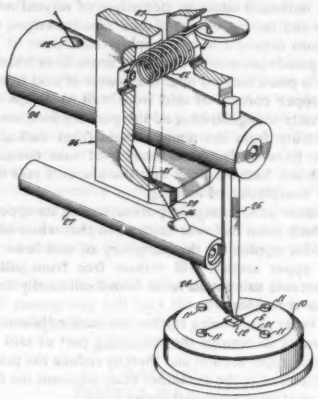
1. An apparatus for thermal welding of a plurality of members together comprising: heating element means comprising at least one element that is heated and directly applied to members to be welded together and means for heating said element; a templet having a void therein for receiving members to be welded together, said void being configured to define molding means for molding molten metal of the members to a desired configuration; and means engaging said heating element means and said templet for providing controlled predetermined relative positioning and relative movement therebetween, having means to move said templet to a position wherein it receives said members for welding, and thereafter to move said heating element means toward said templet and into engagement with the members to be welded, said engagement continuing until the element penetrates a portion of said members in their molten state, and thereafter to withdraw said element relative to molten portions of said members, and thereafter remove said templet from said members.

3,954,217

METHOD AND APPARATUS FOR BONDING AND BREAKING LEADS TO SEMICONDUCTORS

Michael C. Smith, Costa Mesta, Calif., assignor to Orthodyne Electronics, Costa Mesa, Calif.

Filed Sept. 30, 1974, Ser. No. 510,417
Int. Cl.[2] B23K 1/06
U.S. Cl. 228—110 37 Claims



1. A method of effecting ultrasonic bonding of wire to an object and of breaking the wire at the ultrasonic bond, which method comprises:

a. clamping a wire between an object and an ultrasonic bonding tool,

b. applying to said bonding tool sufficient ultrasonic energy to vibrate the same at an ultrasonic frequency and thereby effect an ultrasonic bond between said wire and said object, and

c. applying tension to said wire during at least a portion of the time period during which said ultrasonic energy is being applied to said bonding tool as recited in step (b),

said tension being directed away from said bonding tool and being transmitted through part of said wire to the wire portion immediately adjacent said tool,

said tension being sufficiently low to prevent slipping of said wire from between said bonding tool and said object,

said tension being sufficiently low that said wire would not break if said ultrasonic energy were not applied,

said tension being sufficiently high that said wire breaks immediately adjacent said ultrasonic bond, during said time period when ultrasonic energy is being applied to said bonding tool,

said breaking of said wire being the result of both said application of ultrasonic energy and said application of tension.

23. Apparatus for making an ultrasonic wire bond to a semiconductor circuit, and simultaneously breaking the wire adjacent said bond, which apparatus comprises:

a. a bonding tool,

b. means to clamp said tool down on a wire with predetermined pressure adapted to aid in creation of a good ultrasonic bond between said wire and an underlying portion associated with a semiconductor circuit,

c. means to vibrate said tool at an ultrasonic frequency, and with sufficient amplitude and in such direction and for a sufficient time period, that a good ultrasonic bond is made between said wire and said underlying portion, and

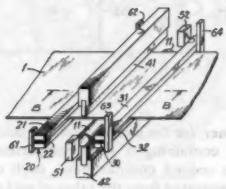
d. means for pulling on said wire during at least part of said time period, in a direction away from said bond, for creating in said wire immediately adjacent said bond a tension which is adequate in conjunction with said ultrasonic vibration to break said wire.

3,954,218

METHOD AND APPARATUS FOR FORMING SHEET METAL AROUND TUBES

Edsger Wybe van Dijk, Albert Neuhuysstraat 25, Utrecht, Netherlands

Filed Feb. 20, 1974, Ser. No. 444,232
Claims priority, application United Kingdom, Feb. 20, 1973, 8327/73
The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.
Int. Cl.[2] B23K 11/10; B23P 15/26
U.S. Cl. 228—173 10 Claims



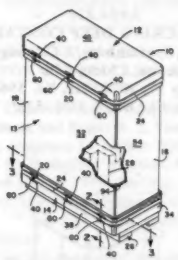
1. A method of connecting a metal tube to a metal sheet suitable for use as a heat exchanger, said method comprising the steps of clamping the sheets across the width of said tube at two parallel spaced-apart locations, placing said tube between said locations parallel therewith and adjacent therewith, and displacing the clamps toward each other to effect a bending of the sheet around the tube whereby portions of the sheet are brought into contact with each other.

3,954,219

PACKAGING

Daniel J. Mangini, Turnersville, and William J. Mauthe, Cinnaminson, both of N.J., assignors to Glenco Refrigeration Corporation, Philadelphia, Pa.

Filed Nov. 12, 1974, Ser. No. 523,048
Int. Cl.[2] B65D 5/35, 45/26
U.S. Cl. 229—23 A 12 Claims



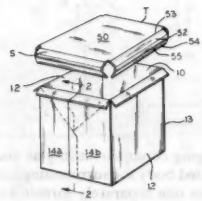
1. In a packaging container having as major components a hollow open-ended body for surrounding contents to be packaged and at least one separately formed end cap adapted to cover and partly overlap an open end of the body, including a plurality of openings through the body and a like plurality of openings through the end cap, the openings in each of such components being aligned with one another and in the respective components being adapted to register in assembly of the container, the improvement comprising a like plurality of banding clips having ends retainable within the body and having band-receiving webs insertable through the registered openings, and a circumferential band adapted to extend within

the webs and around the container to secure the body and end cap together, wherein the webs of the banding clips are recessed relative to the adjacent exterior surface of the end cap, when assembled, and thereby deflect the band, wherever it extends therewithin, from the plane of such exterior surface toward the interior of the container.

3,954,220
LITTER FREE ECOLOGY BOX
John Paul Foster, 550 Shorely Drive, Barrington, Ill. 60610
Filed Feb. 24, 1975, Ser. No. 552,548
Int. Cl.² B65D *5/48*
U.S. Cl. 229—27 **3 Claims**

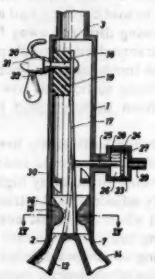
1. A container, for the distribution and sale of foodstuffs for consumption containing a first compartment substantially identical to a second compartment, each of said compartments being separated from the other of said compartments by a partition, so as to form distinct and separate compartments, and the first of said compartments having a formable opening of sufficient size to permit access to said foodstuffs contained within the first of said compartments by manipulation of the users fingers, said second compartment having a formable opening to permit disposal of a waste product within, said waste product derived from the consumption of said foodstuffs subsequent to removal from said container each of said openings being initially closed and comprising a rectangular area having a first set of opposing sides a second set of opposing sides, and a medial line of perforations was inserted, each of said first sides comprising a scoreline to permit easy flexing at said scoreline, each of said second sides being perforated to permit said opening to be formed by the application of slight pressure by the user's thumb, said medial line extending from one of said second sides to the other, said score lines and said perforated lines forming two doors hingedly connected to the remainder of said container along said score lines.

3,954,221
EASY PACKING DEEP CONTAINER
Prentice W. Johnson, Spartanburg, S.C., assignor to Container Corporation of America, Chicago, Ill.
Filed July 17, 1975, Ser. No. 596,806
Int. Cl.² B65D *5/16, 5/72*
U.S. Cl. 229—37 R **2 Claims**



1. An easy packing deep, shipping container formed from foldable paperboard, comprising:
a. a container body having a bottom wall, an opposed pair of front and rear major side walls, and an opposed pair of minor side walls foldably connected to each other and to said bottom wall and upstanding therefrom to form a box-like enclosure open at the top;
b. said side walls having locking flanges foldably connected to their upper edges and extending outwardly and downwardly therefrom;
c. a cover having a top wall with locking flanges foldably connected to the side edges thereof and arranged and disposed for interlocking engagement with the locking flanges of said body;
d. said body front wall comprising a pair of generally co-planar inner and outer front panels foldably connected at their outboard edges to side edges of related minor side walls and having, adjacent their inboard edges, marginal portions disposed in overlapping relation;
e. said panels presenting diverging score lines which extend from a point located near the center of said front wall to the upper corners of said front wall to define a pair of generally triangular-shaped sub-panels which are foldable outwardly from the plane of said front wall along said score lines to facilitate loading of said container and which are foldable back into the plane of said front wall after completion of loading;
f. said inner panel marginal portion having its upper section cut back from its lower section, so that when adhesive is machine applied to the periphery of said lower section, said upper section will remain free from adhesive to permit said sub-panels to be folded outwardly for loading of the container;
g. said inner panel being further cut back adjacent its upper extremity to remove the remaining part of said marginal portion upper section and thereby reduce the thickness of the material in the container body adjacent the flanges of said container body and cover.

3,954,222
WATER MIXER
Curt Arnold Bjorklund, Box 99, and Assar Thomasson, Herralyckedreven 28, both of Ulricehamn, Sweden
Continuation of Ser. No. 263,817, June 19, 1972, abandoned. This application June 6, 1974, Ser. No. 476,819
Claims priority, application Sweden, June 22, 1971, 8071/71
Int. Cl.² G05D *11/16*
U.S. Cl. 236—12 R **14 Claims**



1. A water mixer comprising in combination
a. a main housing,
an inlet port for hot water located in one portion of said housing,
c. an inlet port for cold water located in another portion of said housing,
d. an outlet port for water located in a portion of said housing which is spaced apart from both of said inlet ports,
e. a fluid flow passageway extending between said inlet ports and said outlet port,
f. an elongated reed positioned within said main housing,
1. said reed having a first portion thereof fixedly mounted to the inside wall of said main housing by an adjustable fastener means with a spacer block composed of resil-

ient and heat expansible material for exerting an influence on said reed due to changes of temperature, said material being interposed between said first portion of said reed and the inside wall of said main housing, whereby the reed at a rough setting of the mixer can be moved to a desired swinging position by adjustment of said fastening means,

2. said elongated reed having a second portion which is

A. spaced apart from said first portion,

B. free to have limited movement across the cross section of said fluid flow passageway that is adjacent to said inlets, and

g. a member located in a passageway extending from the outside of said main housing into the interior of said main housing, the end of said member that is inside the main housing being adapted to at least periodically contact said elongated reed at a point intermediate the first and second portions of said elongated reed, and the end of said member that is outside of said main housing being adapted to receive forces applied externally of said main housing and to translate said forces into movement of said member in said passageway which extends from the outside of said main housing into the interior of said main housing,

whereby movement of said reed across the cross section of said fluid passageway will vary the ratio of hot to cold water flowing to said outlet port.

3,954,223

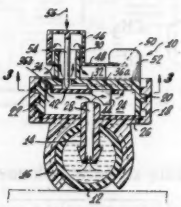
TRICKLE IRRIGATOR

William J. Wichman, and Richard A. Vander Ploeg, both of Glendora, Calif., assignors to Rain Bird Sprinkler Mfg., Corporation, Glendora, Calif.

Filed June 20, 1975, Ser. No. 588,799

Int. Cl.² B05B *1/32*, *15/02*; F16K *15/14*

U.S. Cl. 239—109 **8 Claims**



1. A trickle-flow irrigation valve comprising:

an inlet tube sealably insertable through the wall of a liquid supply hose;

a pressure chamber having

an inlet passage communicating with said inlet tube,

at least one interior wall,

an outlet passage through said wall,

a shallow channel formed in said wall and intersecting with said outlet passage, and

an outlet groove formed in said channel and also intersecting with said outlet passage; and

a valve element of substantially flat resilient material secured at an edge thereof to cover said outlet passage and a substantial portion of said channel;

whereby an initial flow of liquid through said inlet passage into said pressure chamber serves to flush said channel, outlet groove and outlet passage, and whereby development of full supply pressure in said pressure chamber presses said valve element into said channel and thereby limits outlet flow to the cross-section of said outlet groove, and provides a low-pressure low-volume outlet flow.

3,954,224

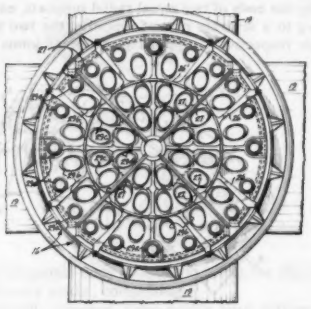
JET NOISE SUPPRESSOR

Ross W. Colebrook, Bellevue; Frank G. Strout, Kent, and Charles P. Wright, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 461,641, April 17, 1974. This application June 23, 1975, Ser. No. 589,075

Int. Cl.² B64D *33/04*

U.S. Cl. 239—265.13 **2 Claims**



1. In a noise suppressor for a jet engine having a tail pipe, including generally circular ported plate means in the path of exhaust gas between the jet engine and the tail pipe, such ports through the plate means being spaced apart circumferentially in each of a plurality of generally concentric annular rows, individual nozzles projecting rearwardly from the respective plate means ports, and means for supplying ventilating air from the periphery of the plate means for flow generally radially inward alongside the downstream side of the plate means between the nozzles, the improvement comprising all of the ports through the plate means in such adjacent concentric rows being of substantially the same size and being flattened generally circumferentially and elongated generally radially of such plate means, and the root portions of the nozzles communicating with such ports being correspondingly flattened generally circumferentially and elongated generally radially of the plate means to facilitate flow of ventilating air generally radially inward adjacent to the downstream side of the plate means between circumferentially adjacent nozzles.

3,954,225

APPARATUS FOR CONTROLLING EXHAUST NOZZLE FLAPS

Andre A. M. L. Camboulives, Savigny-sur-Orge; Theophile F. Le Maout, Cesson, and Roger A. J. Vandenbroucke, Antony, all of France, assignors to Societe Nationale d'Etude et de Constructioin de Moteurs d'Aviation, Paris, France

Filed July 3, 1975, Ser. No. 593,177

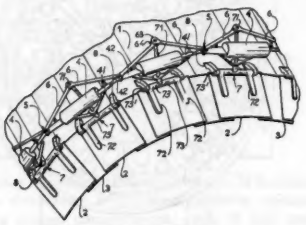
Claims priority, application France, July 4, 1974, 74.23233

Int. Cl.² B64C *15/06*

U.S. Cl. 239—265.41 **4 Claims**

1. Apparatus for the control of movable flaps in a variable section exhaust nozzle by constriction of the flaps, for use in jet engines and particularly in aircraft turbojets, wherein the exhaust nozzle comprises two annular sets of movable flaps alternately arranged in cylindrical segments, each flap being articulated about an axle perpendicular to the axis of the nozzle, the set of flap axles being generally disposed on a circumference centered about the axis of the nozzle; the first set of flaps being controlled flaps and being actuated by fluid jacks, said controlled flaps having spaces therebetween so that they can assume a position of minimum cross-section forming an essentially conical nozzle without abutting against each other; the flaps of the second set being follower flaps and being mounted to span the spaces between said controlled

flaps, and overlapping and engaging said controlled flaps when influenced by combustion gas pressure, the jacks being disposed around and spaced from the controlled flap on axes tangent to a circumference situated in the plane of a diametric median cross-section of said nozzle, said jacks thus forming the sides of a polygon whose perimeter varies as a direct result of the extension of the piston rods of the jacks, characterized in that the end of the body and the end of the piston rod of each jack are connected, respectively, to the end of the body or piston rod of each adjacent jack by pivot joints, each supported by the ends of two equal radial supports, each support belonging to a separate pair of supports, the two supports of each pair respectively supporting the pivot joints which are



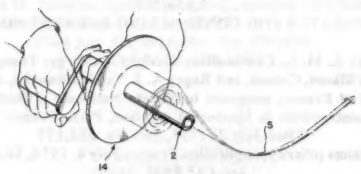
located on either side of each jack and pivoting about a common axle oriented in an axial plane of the nozzle and forming one of the arms of a bellcrank lever, the other arm of each bellcrank lever comprising at least one tab attached to the controlled flap which is facing the said jack; the two arms of each lever being connected by a shaft pivoting about an axis in the diametrical plane of the exhaust nozzle, each pair of supports thus disposed in an isosceles triangle which opens or closes under the effect of the corresponding jack, the axle of the triangle being oriented as a function of the degree of extension or contraction of the polygonal contour constituted of the set of jacks and controlling the orientation of the controlled flap to the bellcrank lever to which said axle belongs.

3,954,226

STRAP COILING MECHANISM

Phillip A. Pickering, 5823-177th Place SW., Lynnwood, Wash. 98036

Filed Apr. 8, 1974, Ser. No. 458,557
Int. Cl.² B65H *75/40*
U.S. Cl. 242—96 **2 Claims**



1. A strap coiling device comprising:

a. a coiling spool including an elongated slot extending axially from an end thereof a distance equal to the width of the widest strap to be coiled and a smooth cylindrical portion opposite to the slotted end,

b. radially extending crank arm means having a handle means secured to the outer end of the cylindrical portion to cause rotation of the coiling spool about its axis, and

c. ejection and guide means having a hollow cylindrical handle portion axially and rotatably movable relative to the coiling spool overlying the cylindrical portion of the spool adjacent the handle means and a radially outwardly extending guide disk adjacent the inner end of the elongated slot whereby the first end of a strap may be placed in the slot adjacent the guide disk, the guide disk held relatively stationary while the spool is rotated about its axis, coiling the strap adjacent the guide and upon completion of the coiling, the ejection and guide means moved axially relative to the spool removing the coiled strap.

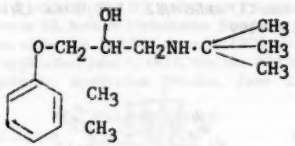
3,954,227

PHARMACEUTICAL COMPOSITIONS CONTAINING 1-(2',3'-DIMETHYLPHENOXY)-3-TERT. BUTYLAMINO-2-PROPANOL OR PHARMACEUTICALLY ACCEPTABLE SALT THEREOF FOR TREATING OR PREVENTING CORONARY DISORDERS

Kunio Tsukamoto, Tokyo; Yasushi Suzuki, Yokohama; Akihiro Izumi, Kawasaki, and Yoshio Hiramatsu, Tokyo, all of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 92,252, Nov. 23, 1970. This application Jan. 16, 1973, Ser. No. 324,100
Claims priority, application Japan, Nov. 28, 1969, 44-95027; Mar. 31, 1970, 45-26548; Mar. 31, 1970, 45-26549; July 21, 1970, 45-63377; Oct. 16, 1970, 45-90429; Nov. 13, 1970, 45-99733
Int. Cl.² A61K *31/125*
U.S. Cl. 424—330 **10 Claims**

1. A method of treating or preventing coronary disorders in a human by blocking the activity of the beta-adrenergic nerve which comprises administering to a human body in need thereof via the intestinal absorption route in an amount ranging from 0.5 milligrams to 100 milligrams a compound of the formula



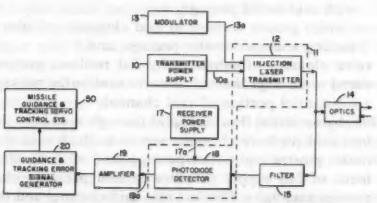
or a pharmaceutically acceptable salt thereof.

3,954,228

MISSILE GUIDANCE SYSTEM USING AN INJECTION LASER ACTIVE MISSILE SEEKER

William A. Davis, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 508,173, Nov. 16, 1965, abandoned. This application Feb. 23, 1968, Ser. No. 707,888
Int. Cl.² F41G *7/00*; G01J *1/20*
U.S. Cl. 244—3.16 **3 Claims**



1. An active missile guidance system mounted in the nose portion of a missile and comprising: an injection laser trans-

mitter enclosed in a cryogenic environment and having a power supply and modulator connected thereto for providing a pulsed beam of infrared radiation therefrom; a photodiode infrared detector having a power supply connected thereto and displaced alongside said transmitter inside said cryogenic environment for receiving pulsed radiation reflected from a target; a circular optical system disposed adjacent said transmitter and said detector for focusing transmitted and reflected radiation to and from said transmitter and photodiode infrared detector; a conical scanning means including said injection laser transmitter and said photodiode infrared detector being eccentrically mounted in the proximity of a central axis of said circular optical system and means for nutating said injection laser transmitter and photodiode detector in a manner whereby transmitted and reflected pulsed beams of radiation may be transmitted and received through said circular optical system, said conical scanning means further including a conical scan motor for rotating said optical system, transmitter and detector as a unit in a circular manner; means interconnected to said photodiode detector and responsive to error signals from said photodiode detector for amplifying and generating guidance and tracking error signals for said missile and wherein in-flight guidance of said missile is possible toward said target at all aspect angles to thereby provide active homing of said missile on said target.

3,954,229

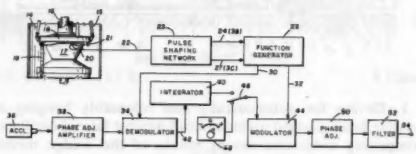
AUTOMATIC ONE-PER-REV CONTROL SYSTEM

William F. Wilson, Bedford, Tex., assignor to Textron, Inc., Providence, R.I.

Filed Jan. 2, 1975, Ser. No. 538,121

Int. Cl.[2] B64C *27/70*

U.S. Cl. 244—17.13 **25 Claims**



6. A system for controlling one-per-rev vibrations in a helicopter, comprising in combination:

means for generating a reference signal having a frequency related to the speed of rotation of a helicopter rotor and at a phase corresponding to a desired cyclic pitch,

manually adjustable means for generating a ride control voltage having a magnitude related to a desired vibration correction, and

means for modulating the ride control voltage with the reference signal to be applied to a helicopter rotor cyclic pitch control.

17. The method of controlling one-per-rev vibrations in a helicopter, comprising the steps of:

generating a signal related to the motion of a helicopter rotor blades including a blade position reference signal,

generating a frequency signal having a phase corresponding to a desired cyclic pitch in response to the signal related to blade motion and the blade position signal,

generating a vibration related signal dependent upon the amplitude and phase of one-per-rev vibrations in a fuselage of the helicopter,

sampling and storing the vibration related signal to establish a control voltage proportional to a maximum amplitude of said vibrations, and

applying said frequency signal to a cyclic control of a helicopter rotor assembly at an amplitude dependent upon said control voltage.

3,954,230

FLOW ELEMENTS FOR INFLUENCING FLOWING MEDIA

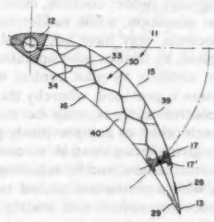
Friedrich Machuta, Uhldingen, Germany, assignor to Dornier System GmbH, Germany

Filed July 1, 1974, Ser. No. 484,690

Claims priority, application Germany, Sept. 26, 1973, 2348304

Int. Cl.[2] B64C *3/48*

U.S. Cl. 244—44 **12 Claims**



1. An aerodynamic body adapted to affect the direction of flow of a flowing media, comprising;

a longitudinally-disposed, fixed-profile nose portion;

a longitudinally-disposed trailing edge portion spaced from said nose portion;

a flexible upper and a flexible lower skin portion forming the profile contour of said body, fixedly attached to one of said nose portion and said trailing edge portion and slidably coupled to the other of said nose portion and said trailing edge portion;

a flexible skeleton support fixedly coupled to said nose portion and said trailing edge portion and spanning said body adjacent the center thereof;

a plurality of longitudinally-disposed bracing elements fixedly coupled to each of said upper and said lower skin portions, transversely spaced from one another and of generally V-shaped cross-section, with their apexes in sliding contact with said skeleton support; and

adjusting means operatively coupled to said body and adapted to flex one of the trailing portion and the leading portion of said body with respect to the other.

3,954,231

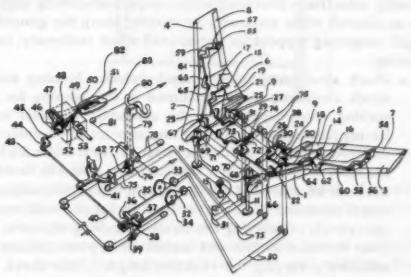
CONTROL SYSTEM FOR FORWARD WING AIRCRAFT

Norman T. L. Fraser, 4597 Candleberry Ave., Seal Beach, Calif. 90740

Continuation of Ser. No. 504,680, Sept. 9, 1974, abandoned. This application June 16, 1975, Ser. No. 587,364

Int. Cl.[2] B64C *13/04*

U.S. Cl. 244—83 C **12 Claims**



8. Aircraft having a main wing with aileron controls, said aircraft further including lifting and controlling wing surfaces,

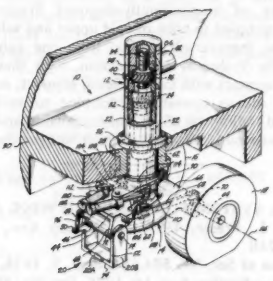
having a monoplane wing extend outboard vertically and horizontally, from the fuselage to which it is attached on each side, to provide a dihedraled condition, forming the inner portions of the wing, and spreading outboard further on each side from this inner wing, at a horizontal, or near-horizontal condition, are additional wing portions which move simultaneously, and built around a suitable wing spar bearing, which provides a capability to carry the wing surface, and also make these outer portions, have a direct angle of attack change, by direct pilot actuated, fore and aft, control column movements, and inner trailing edge rudder controls, move differentially, by pilot rudder bar actuation, while rudder and outer elevator trailing edge controls, may have additional elevator control movements applied, by further pilot operated individual hand controls, and in addition by pilot control wheel, rotation, a means of actuation is provided, whereby the outer horizontal trailing edge control surfaces, may be moved in opposite directions, to each other, at any previously positioned, elevator location, to give aileron control, to assist with the main wing aileron control action, and by selecting inner, and outer surfaces areas, with a restriction placed on the outer wing angle of incidence movement, and trailing edge movement, outer wing stalling will then be assured before inner wing surfaces may stall, and a means whereby elevation control may be applied to the inner rudders, without inducing inadvertent rudder control, and also additional rudder means placed at the opposite end of the aircraft may be actuated with the rudders being described above.

3,954,232

KNEELABLE AIRCRAFT LANDING GEAR

Philip M. Harper, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 11, 1974, Ser. No. 522,503
Int. Cl.² B64C *25/66*
U.S. Cl. 244—102 R **12 Claims**



1. An articulated, variable-height aircraft landing gear assembly selectively providing either impact-absorbing support to an aircraft while stationary or moving along the ground or rigid, unsprung support for the aircraft when stationary, comprising:

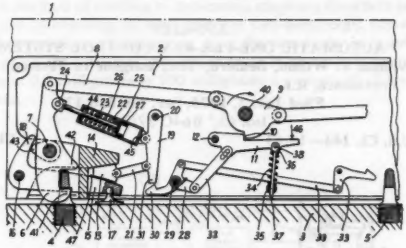
a shock strut comprising a rigid, tubular housing and a shock absorbing means mounted in the housing for absorbing shock applied to the assembly; a wheel lever having first and second ends; means pivotably connecting the lever to the strut housing near the first end such that the lever is pivotable in a vertical plane about its first end between an extended position and a retracted position; a wheel mounted on the lever near its second end; means operatively connecting the shock absorbing means to the lever between its first and second ends; power means for selectively varying the effective length of the shock absorbing means to thereby move the lever between its extended and retracted positions and thereby vary the effective height of the landing gear assembly; rigid, aircraft support means for supporting at least a portion of the load borne by the landing gear assembly, the support means being mounted on the housing near the first end of the lever and defining a flat, ground engaging surface on the underside thereof, the support means extending downwardly from the housing a distance such that when the wheel is in contact with the ground and the lever is moved from its extended position toward its retracted position, the flat surface of the support means contacts the ground and at least a portion of the load borne by the landing gear assembly is transferred from the wheel to the support member, the support means and the housing together defining a rigid, unsprung load path through the strut.

3,954,233

AUTOMATIC HANGING AND WEDGING DEVICE FOR AIRCRAFT LOADS

Jean H. Hasquenoph, Lagny, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, Valenton, France

Filed Mar. 13, 1975, Ser. No. 557,980
Claims priority, application France, Sept. 16, 1974, 74.31180; Nov. 15, 1974, 74.37645
Int. Cl.² B64D *1/02*
U.S. Cl. 244—137 R **11 Claims**



1. Device for automatically and releasably hanging and holding loads carried under aircraft against lateral oscillation, comprising automatic detent means of the wedge member type for retaining the load, means for mechanically connecting said detent means to a pivoting suspension hook when said suspension hook is engaged by the load, and automatic load holding means adapted to hold the load against lateral oscillation, said automatic load holding means being actuated directly by said hook.

3,954,234

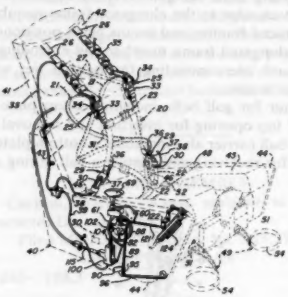
SINGLE POINT GROUND EMERGENCY SEAT RESTRAINT DIVESTMENT SYSTEM

Richard H. Frost, Littleton, and Ronald Criley, Lake City, both of Colo., assignors to Frost Engineering Development Corporation, Englewood, Colo.

Filed Sept. 25, 1974, Ser. No. 509,253
Int. Cl.² B64D *17/30*
U.S. Cl. 244—151 A **12 Claims**

11. In a restraint divestment system for releasing a crewman equipped with a parachute and restraint harness from an aircraft ejection seat mounted restraint assembly in the event of a ground emergency, wherein said seat mounted restraint assembly includes means for securing shoulder restraints and parachute canopy risers and a seat mounted survival kit to said harness, the improvement comprising: hot gas actuated means for releasing said securing means, system actuating means mounted on the ejection seat, hot gas rapid deflagrating cord interconnecting said system actuating means and said hot gas actuated releasing means, and means releasably interconnecting said hot gas rapid deflagrating cord and said system actuating means, said rapid deflagrating cord being adapted for

producing hot gas for substantially simultaneously releasing said securing means upon the operation of said system actuating means thereby to release said survival kit, shoulder restraints and parachute canopy risers from the restraining harness without releasing said restraining harness from the crewman.



3,954,235

KITES

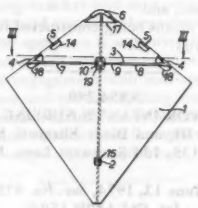
Peter Trevor Powell, 2, Robertson Road, Shurdington, Cheltenham, England

Filed Aug. 21, 1974, Ser. No. 499,282

Claims priority, application United Kingdom, Aug. 28, 1973, 40445/73

Int. Cl.[2] B64C *31/06*

U.S. Cl. 244—153 R **4 Claims**



1. A kite comprising:

sheeting spread by means of a longitudinal spar and a lateral spar, said spars being disposed upon opposite sides of said sheeting;

said lateral spar comprising two portions laterally spaced apart from each other;

a laterally extending rod-like spring member interposed between and interconnecting said lateral spar portions, the ends of said spring member being fixedly secured within bores of said spar portions; and

bracing members extending solely along the leading edges of said sheeting and flexibly connected to the forward end of said longitudinal spar,

said lateral spar extending between and connected at intermediate points of said bracing members.

3,954,236

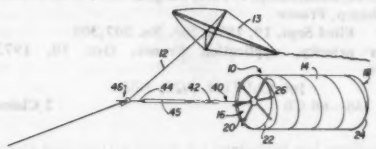
WIND ACTUATED ROTATABLE TUBULAR DEVICE

Roswell F. Brown, 1015 Hinman Ave., Evanston, Ill. 60202

Filed May 14, 1975, Ser. No. 577,545

Int. Cl.[2] B64C *31/06*

U.S. Cl. 244—155 R **6 Claims**



1. A knock-down wind actuated rotatable tubular device comprising, a generally tubular member formed of a collapsible and flexible material having an inlet opening at one end and an outlet opening at the other end thereof, rigid means defining said inlet and outlet openings, said rigid means comprising rods which are detachably secured to said tubular member, said rods at said outlet end having a plurality of generally flat blade-like members secured thereto, said rods at said inlet end being connected to each other and said rods at said outlet end being connected to each other, each of said rods having stop means positioned adjacent its opposite ends but spaced from the ends of respective rods to provide tips on said rods which tips fit in openings in said tubular member for holding said tubular member in expanded or extended position, means for attaching said tubular member to an anchoring member so that the wind passing through said tubular member will strike and impinge against said blade-like member to cause said tubular member to rotate with respect to said anchoring member.

3,954,237

CABLE RACEWAY FOR ELECTRIC LINES

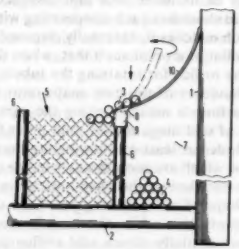
Martin Harbarth, Darmstadt; Ewald Steiner, Allmannshausen, and Franz Dolansky, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 24, 1974, Ser. No. 491,372

Claims priority, application Germany, July 30, 1973, 2338586

Int. Cl.[2] F16L *3/22*

U.S. Cl. 248—68 R **5 Claims**



1. A cable raceway system for electric or communication lines or the like, comprising:

a plurality of side by side cable raceways, each of which is defined by a base member and side wall members extending vertically from said base member.

guiding means extending from alternate ones of said cable raceways for receiving said lines and guiding them therein, said guiding means overlapping and at least partially covering others of said cable raceways adjoining, respectively, said alternate ones of said cable raceways, said guiding means being moveably connected to ones of

said side wall members to permit uncovering of said other cable raceways.

3,954,238

SAFETY CLAMP

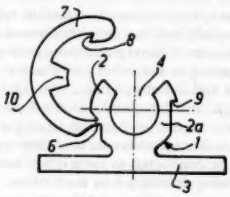
André Nivet, Beauchamp, France, assignor to ITW de France, Beauchamp, France

Filed Sept. 19, 1974, Ser. No. 507,309

Claims priority, application France, Oct. 10, 1973, 73.36176

Int. Cl.² F16L *3/22, 3/08*

U.S. Cl. 248—68 CB **2 Claims**



1. Safety clamp for securing at least one element of a general tubular or regular prism shape constituted by a one-piece moulded member mounted on a base for attachment to a wall, comprising: a collar with at least two arms for receiving and maintaining without play at least one tubular element to be attached, said collar provided with at least one orifice for introducing said at least one element inside the collar, said orifice formed by the space between the free extremities of adjacent arms, the inner face of said collar substantially matching the shape of at least 50% of the outer face of said at least one element; a security cam constituted by a member generally annular in configuration and having its inner face matching the balance of the shape of the outer face of said element and having its longitudinal axis parallel to that of the collar, one extremity of said cam is connected to one of the arms of the collar by means of a hinge formed by a thin strip integrally moulded to the collar and the cam about which hinge it is movable in rotation parallel to the longitudinal axis of the collar, said cam including two shoulders turned towards the concavity of its inner face and disposed adjacent each extremity, said shoulders each cooperating with a shoulder the shape of which matches it, externally disposed on the adjacent arm of the collar at a point such that, when the cam is closed down over the orifice for retaining the tubular element in the collar, the shoulders of the cam snaps onto the shoulders of said collar to form a means locking the cam onto the collar independent of said hinge means, said inner face of the security cam includes at least one projecting cusp the shape and dimensions of which are such that, when the cam is in locking position, the end face of the cusp matches a substantial portion of the shape of at least one part of the outer face of the tubular elements located in the introduction orifice of the collar and substantially closes said orifice and is in contact with said outer face of said element to secure said element without play within said collar.

3,954,239

CARRIER FOR GOLF EQUIPMENT OR SIMILAR ITEMS

Charles F. Kerbs, Jr., 1836A Wildberry Drive, Glenview, Ill. 60025

Filed Jan. 7, 1974, Ser. No. 431,329

Int. Cl.² A63B *55/00*

U.S. Cl. 248—96 **1 Claim**

1. A carrying device for golf clubs having a skeletonized construction, the improvement comprising:

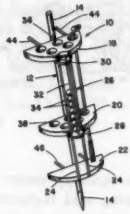
an elongated frame member having a handle portion and having an end portion for upright positioning of the carrying device;

a plurality of club supporting tiers including a bottom tier and at least two upper tier means having openings adapted to receive golf clubs for portable transport;

said supporting tiers being in vertical alignment and attached at an edge to the elongated frame member;

a pair of spaced framing rod means being positioned opposite the elongated frame member and extending parallel thereto and interconnecting the bottom tier with each upper tier means;

a ball carrier for golf balls including a top plate with an enlarged top opening for insertion and removal of balls, and said ball carrier also including a bottom plate with an opening for receiving and nesting a ball during storage;



said top and bottom plates of the ball carrier being mounted adjacent said pair of framing rod means, and a reinforcing rod also extending from the bottom plate to the top plate and cooperating with said framing rod means to form an elongated triangular ball holding enclosure for storing a plurality of golf balls; and,

fixed stabilizing leg means extending outwardly and generally horizontally from said carrying device and being adapted to combine with the elongated frame member for bracing the article carrying device in an inclined position,

each upper tier means having a thicker portion surrounding said openings and extending around the periphery thereof, and, a thinner web section interconnecting the thicker portions; and

each upper tier means being constructed from an injection molded material.

3,954,240

SUPPORT FOR INFANT'S NURSING BOTTLE

Lorentz Schmidt, III, and Diane Elizabeth Schmidt, both of R.F.D. 2, Box 135, 134 Sunswept Lane, High Ridge, Mo. 63049

Filed June 12, 1974, Ser. No. 478,507

Int. Cl.² A47D *15/00*

U.S. Cl. 248—104 **2 Claims**

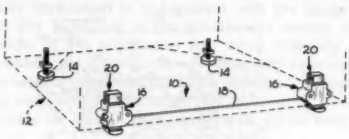
1. A support for a nursing bottle for use by an infant comprising an elongated member having a hook-like element at its upper end, a bottle-gripping loop at its lower end, and an

intermediate elongated portion sufficiently stiff to maintain the bottle in a substantially horizontal position and sufficiently flexible to accommodate substantial movements of the infant's head without loss of the bottle from the infant's mouth, the plane of said loop being substantially vertical and substantially perpendicular to the plane of said hook-like element, said hook-like element being formed for close-fitting immovable engagement with external structure located above the infant's head, a continuous length of nonmetallic flexible tubing forming said hook-like element, said intermediate portion and said loop, and stiffeners in the respective ends of said length of flexible tubing shaped to form said hook-like element and said loop.

3,954,241
LEVELING ASSEMBLY

John A. Carlson, Wichita, Kans., assignor to Conchemco, Incorporated, Lenexa, Kans.

Filed Mar. 31, 1975, Ser. No. 563,774
Int. Cl.² F16M *11/24*
U.S. Cl. 248—188.3 **5 Claims**



1. A leveling assembly for appliances or the like, said assembly comprising:

a pair of brackets adapted to be secured to the appliance, each bracket having a leg member freely shiftable vertically relative thereto and engageable with a floor surface beneath the appliance;

connecting means extending from one bracket to the other and interconnecting said leg members with each other for mutual movement thereof,

each leg member being free to shift vertically relative to its corresponding bracket and in a reciprocal relationship with its associated member when substantially none of the weight of the appliance is supported thereby; and

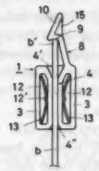
structure incorporated with each bracket and disposed to be in frictional engagement with said connecting means to lock the same and prevent shifting movement of said leg members relative their brackets when both leg members are in contact with the floor in support of at least a portion of the weight of the appliance.

3,954,242
PLASTIC FASTENER

Tohru Yoda, Yokohama, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed Oct. 10, 1974, Ser. No. 513,790
Claims priority, application Japan, Oct. 11, 1973, 48-117345[U]
Int. Cl.² H01R *13/54;* **H02B** *1/02;* **H02G** *9/00*
U.S. Cl. 248—223 **6 Claims**

1. A one-piece plastic fastener for insulatingly fixing a plate-like member to a support structure comprising a body formed with a groove extending length-wise along one surface of said body and adapted to hold the plate-like member therein, at least one cavity extending longitudinally in said body and disposed parallel to but spaced from said groove to form a dielectric resilient wall between the cavity and the groove, at least one spring member disposed within said cavity and acting against the resilient wall adjacent to said groove to provide a resilient bias against the plate-like member when positioned in said groove, anchoring means extending perpendicular from said body for securing same to the support structure, a resilient integral arm extending longitudinally away from one end



of said body having means for contacting and positioning the member held in said groove in a retained fashion.

3,954,243
SUPPORT FASTENER

Larry L. Sharp, Schaumburg, and Joseph Smrz, Arlington Heights, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 7, 1974, Ser. No. 449,798
Int. Cl.² F16M *13/00*
U.S. Cl. 248—235 **23 Claims**

1. A one-piece plastic fastener in combination with a non-circular aperture in a panel, said fastener including a base adapted to cover said aperture and having rear surface means defining a reference for engaging the panel and support means on the opposite surface of said bade adapted to engage secondary means, an integral substantially rigid curved hook-like stud which extends outwardly from a root portion adjacent the rear surface of said base and thence reversely bends toward said reference with the free end of said hook-like stud extending beyond an edge margin of said base and terminating in spaced relation to said reference a predetermined distance so that said base rear surface means contacts one surface of said panel while said free end will contact the opposite surface of said panel, said root of said stud having a cross-sectional configuration which at least at a plurality of points is complementary to said aperture and provides shoulder means adjacent to said base which in installed position engages in load bearing relationship walls of the panel forming said aperture so as to substantially prevent motion of said fastener in the plane of said panel, and resilient non-load bearing retaining means carried by said stud and cooperating with said aperture to prevent unintentional retrograde removal of said fastener from installed relation with said panel.

3,954,244
ADJUSTABLE INSTRUMENT BASE

Herbert Gopstein, Wilmington, Del., assignor to Washington Nichibei Consultants, Inc., Washington, D.C. and Steven W. Weinrieb, Silver Spring, Md., a part interest to each

Continuation of Ser. No. 392,506, Aug. 29, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,830
Int. Cl.² A47G *23/00*
U.S. Cl. 248—349 **4 Claims**

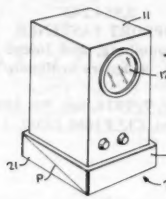
1. An adjustable base for mounting a viewing or control instrument of a given size thereon, comprising:

a bottom base part having upper and lower planar surfaces;

a top base part having upper and lower planar surfaces and being disposed in operative relationship with said bottom base part;

the upper surface of said bottom base part and the lower surface of said top base part being disposed obliquely with respect to their respective lower and upper surfaces and parallel to each other so as to render said top and bottom base parts substantially triangular or wedge-shaped in cross-section;

adjusting means for permitting said top base part to be rotated relative to said bottom base part such that the upper surface of said top base part is obliquely disposed relative to a surface supportng said adjustable base, and for permitting an instrument disposed upon said upper surface of said top base part to be rotated relative to said top base part such that a frontal or facial portion of the



instrument is obliquely disposed, either upwardly away from or downwardly toward, the surface supporting said adjustable base, dependng upon the relative rotation between the instrument and said top base part;

said adjusting means including first pivot means having an axis disposed perpendicular to each of the upper and lower planar surfaces of said bottom and top base parts, respectively, and offset from the geometrical center of the planar area of each of said upper and lower planar surfaces of said bottom and top base parts, respectively, such that said first pivot means is disposed within the thicker half portion of said wedge-shaped bottom base part while being simultaneously disposed within the thinner half portion of said wedge-shaped top base part, and second pivot means having an axis disposed perpendicular to said upper surface of said top base part and located at the geometrical center thereof.

3,954,245

VEHICLE SEAT AND SUPPORT ASSEMBLY THEREFOR

Robert W. Costin, Troy, Mich., assignor to Lear Siegler, Inc., Detroit, Mich.

Filed Mar. 3, 1975, Ser. No. 554,863

Int. Cl.[2] F16M *11/00;* **A47C** *3/30*

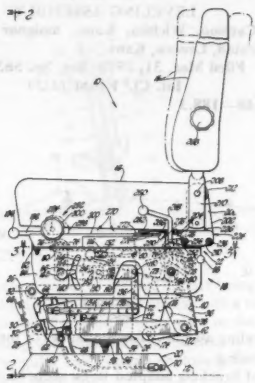
U.S. Cl. 248—400 **13 Claims**

1. In a vehicle seat support assembly including a lower base adapted to be mounted on a vehicle floor and a movable upper base for supporting a seat, an adjustable fluid support system for the seat comprising:

a fluid spring extending between the upper and lower bases and including a chamber for receiving pressurized fluid from a source of pressurized fluid so as to raise the upper base with respect to the lower base, the fluid spring lowering the upper base upon exhausting pressurized fluid within the chamber thereof;

a valve for controlling the flow of pressurized fluid to and from the chamber of the fluid spring, the valve being mounted on the lower base and having an equilibrium position where pressurized fluid is isolated in the chamber and first and second actuated positions to which the valve is alternately movable in opposite directions from the equilibrium position, the valve communicating the chamber to the source of pressurized fluid in the first actuated position thereof and communicating the chamber to exhaust pressurized fluid therein in the second actuated position thereof; and

a manually adjustable control linkage having a rigid actuating link connected to the valve, an elongated adjustment link pivotally mounted about an intermediate portion thereof between its opposite ends on the upper base for manual adjustment at a location above the actuating link, and a connecting link extending between the lower actuating link and one end of the upper adjustment link, the control linkage moving the valve from the equilibrium position to the first actuated position upon downward movement of the upper base from a vertical position corresponding to the adjusted position in which the adjustment link positions the control linkage, the control linkage moving the valve from the equilibrium position to



the second actuated position upon upward movement of the upper base from a vertical position corresponding to the adjusted position in which the adjustment link positions the control linkage, and the control linkage including positioning means extending between the upper base and the other end of the adjustment link in a spaced relationship to the pivotal axis of the adjustment link, the positioning means normally preventing rotation of the adjustment link but selectively allowing such movement in opposite directions to raise or lower the vertical position of the upper base that corresponds to the equilibrium position of the valve so as to thereby provide for vertical adjustment of the upper base.

10. In a vehicle seat support assembly including a lower base adapted to be mounted on a vehicle floor and a movable upper base for supporting a seat, an adjustable fluid support system for the seat comprising:

a fluid spring extending between the upper and lower bases and including a chamber for receiving pressurized fluid from a source of pressurized fluid so as to raise the upper base with respect to the lower base, the fluid spring lowering the upper base upon exhausting pressurized fluid within the chamber thereof;

a time delay valve for controlling the flow of pressurized fluid to and from the chamber of the fluid spring, the valve being mounted on the lower base and having an equilibrium position where pressurized fluid is isolated in the chamber and first and second actuated positions to which the valve is alternately movable in opposite directions from the equilibrium position, the valve communicating the chamber to the source of pressurized fluid after being moved to the first actuated position thereof for a predetermined period of time, and the valve communicating the chamber to exhaust pressurized fluid therein after being moved to the second actuated position thereof for a predetermined period of time; and

a manually adjustable control linkage having an actuating

link pivotally supported by the valve, an elongated adjustment link pivotally mounted on the upper base in a first class lever manner for manual adjustment, and a connecting link pivotally connected to the actuating link and one end of the adjustment link, the control linkage moving the valve from the equilibrium position to the first actuated position upon downward movement of the upper base from a vertical position corresponding to the adjusted position in which the adjustment link positions the control linkage, the control linkage moving the valve from the equilibrium position to the second actuated position upon upward movement of the upper base from a vertical position corresponding to the adjusted position in which the adjustment link positions the control linkage, the linkage movement being prevented from transiently supplying and exhausting pressurized fluid in the fluid spring upon abrupt vertical movement of the upper base during use by the time delay operation of the valve, the upper base including a flange having an arcuate slot, the other end of the adjustment link including a handle that extends through the arcuate slot in the flange, a pin-and-slot means for pivotally mounting the intermediate portion of the adjustment link or the upper base, and a spring that biases the adjustment link so the handle thereof is normally maintained in engagement with the flange within the slot by sliding at the pin-and-slot means, and the handle of the adjustment link being manually moved upwardly and downwardly to respectively raise and lower the vertical position of the upper base that corresponds to the equilibrium position of the valve so as to thereby provide for vertical adjustment of the upper base.

3,954,246

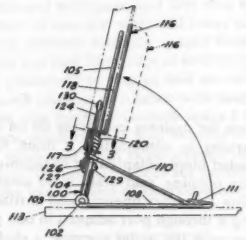
BOOK HOLDER

Virgil M. Sparkman, 3003 Duff Drive, Arlington, Tex. 76010

Continuation of Ser. No. 210,734, Dec. 22, 1971, abandoned. This application July 12, 1974, Ser. No. 487,887

Int. Cl.² A47B *97/04*

U.S. Cl. 248—453 **10 Claims**



1. A holder for supporting a book in open reading position comprising

a base assembly comprising a horizontally elongated frame defining a supporting plane for an open book, including pivot means disposed in a central upright axis in said supporting plane; and support means mounted on said frame for supporting said frame, on a horizontal surface, in a reading plane inclined from a vertical plane;

a pair of page holding arms pivotally mounted adjacent to respective ends of said frame, to swing within the book supporting plane; said arms being disposed and formed to extend upward from said frame for engagement with the side marginal edges of the open pages of the book;

a book support assembly rotatably mounted on said base assembly for supporting a book in the book supporting plane; said book support assembly including means for supporting the spine portion of the book, and spring means having laterally extending arms for urging the book covers toward said page holding arms in the book supporting plane;

said book support assembly including pivot means disposed in a central upright axis; and said support assembly pivot means and said base assembly pivot means coacting to provide a rotary mounting for said support assembly through 180° relative to said base assembly; said holder being thereby adapted to support a book in the book supporting plane in either of oppositely facing directions.

3,954,247

MIRROR MOUNTING

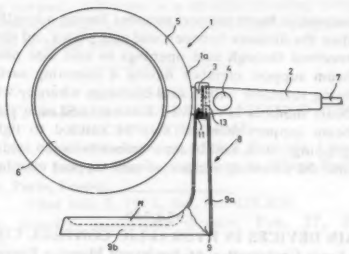
Kurt Krusche, Frankfurt am Main, Germany, assignor to Allstar Verbrauchsguter GmbH & Co. KG., Frankfurt am Main, Germany

Filed May 1, 1974, Ser. No. 466,020

Claims priority, application Germany, May 8, 1973, 2323039

Int. Cl.² A47F *7/14*; A47G *79/00*

U.S. Cl. 248—471 **6 Claims**



1. A mounting for a mirror held in a frame for selective use as a hand mirror, standing mirror and wall mirror, comprising the combination of

1. a handle having one end attached to the mirror frame,
   a. the one handle end defining a relatively deep peripheral groove,
2. a holder bracket consisting of two essentially plate-shaped arms enclosing an angle with each other,
   a. a first one of the bracket arms having a free end defining an outwardly open recess adapted to receive the peripheral groove on the one handle end and to form a seat for this grooved handle end,
   b. a bead in the open recess, the bead fitting into the peripheral groove,
   c. a second one of the bracket arms defining a substantially flat support surface, and
3. a resilient locking device arranged in the recess for engaging a portion of the one handle end adjacent the groove.

3,954,248

SPANNER BEAM HANGER ASSEMBLY

Stanley Barber, 3310 S. 27th St., Fort Smith, Ark. 72901

Filed Dec. 12, 1974, Ser. No. 532,217

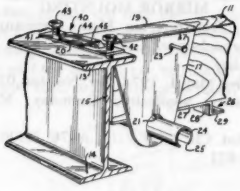
Int. Cl.² E04G *17/00*

U.S. Cl. 249—211 **3 Claims**

1. A hanger assembly for supporting a beam member from a support surface, said assembly comprising:

a bracket having a pair of parallel side plates spaced apart sufficiently to receive therebetween the beam member at the end thereof and a top web member interconnecting said side plates to overlie the beam member received between said side plates, said bracket further including openings formed through said side plates in alignment with one another, said openings substantially positioned

beneath the beam member when said member is received between said side plates and is engaged with said top web; an extension member comprising a base plate positionable to underlie said top web and adapted to be disposed between said top web and said beam member when said bracket is installed thereon, an intermediate web integrally joined to one end of said base plate and extending perpendicularly upwardly therefrom, and a tongue plate integrally joined to the top of said web and extending perpendicularly laterally therefrom to overlie said support surface;



an eccentric beam support member having a length greater than the distance between said side plates and sized to be received through said openings in said side plates, and beam support member having a camming surface and being rotatable within said openings whereby when said beam member is received between said side plates said beam support member may be rotated to tightly and grippingly lock said beam member between said top web and the camming surface of said support member.

3,954,249

DRAIN DEVICES IN HYDRAULIC CONTROL CIRCUITS

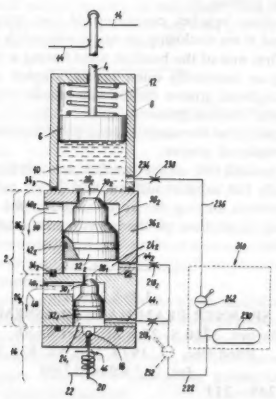
Jean Louis Gratzmuller, 66 boulevard Maurice Barres, Neuilly-sur-Seine, France

Filed Mar. 21, 1975, Ser. No. 560,779

Claims priority, application France, Mar. 26, 1974, 74.10294

Int. Cl.² F16K *31/124*

U.S. Cl. 251—29 **14 Claims**



1. A valve device for draining high pressure liquid from an enclosure, comprising a body defining at least two aligned cylinders of successively increasing internal diameter, a piston slidably disposed in each cylinder and dividing the same into a discharge chamber and a pressure chamber, each discharge chamber having an outlet port and an inlet port forming a valve seat, a valve element carried by each piston for closing against said valve seat, the inlet port of the largest diameter discharge chamber communicating with said enclosure and the inlet port of any smaller diameter discharge chamber communicating with the pressure chamber of the adjacent larger cylinder, means for supplying liquid under pressure to all the pressure chambers whereby to move each valve element through the related piston towards its valve seat and maintain it in the seated position, and means for discharging the pressure liquid from the smallest diameter pressure chamber in response to a drain signal.

3,954,250

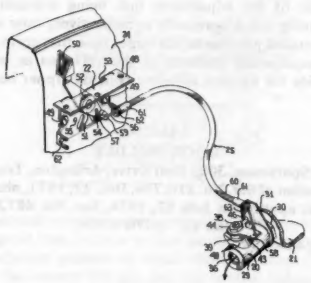
REMOTELY CONTROLLED CRANKCASE OIL DRAIN VALVE

Michael H. Grace, Terry, Miss., assignor to Paul E. Bradshaw, Jackson, Miss.

Filed Jan. 14, 1975, Ser. No. 541,066

Int. Cl.² F16K *31/46*

U.S. Cl. 251—144 **7 Claims**

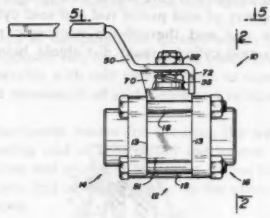


1. Mechanism for draining crankcase oil on an automotive vehicle comprising in combination a drain valve assembly having a threaded nipple adapted for engagement in a crankcase drain plug opening, said drain valve assembly having a casing including an outlet opening and a rotary plug valve element having a through port adapted in one position of the plug to register with the outlet opening, a shaft on the valve assembly at right angles to the axis of the outlet opening and secured to said plug for rotating it to valve closed and valve open positions, a crank arm attached to said shaft externally of said casing and operable to turn the shaft with said plug and having a stop extension, a cooperating pair of stop elements on the valve assembly in spaced relation engageable with the stop extension to arrest movement of the crank arm at two positions corresponding to the valve closed and valve open positions of the plug, a remote mounting bracket adapted for attachment to a structural member of a vehicle in a desired position beneath the hood, a manual lever pivotally mounted on said bracket and swingable to valve closed and valve open positions of said bracket, detent means on the lever and bracket cooperating to releasably hold the lever at the valve closed position, and transmission means interconnecting the lever and said crank arm of the valve assembly, whereby movements of the former produce corresponding movements of the latter to and from said valve open and valve closed positions.

3,954,251
FLUID SYSTEM DEVICE

Francis J. Callahan, Jr., Chagrin Falls; Bernard J. Gallagher, South Euclid, both of Ohio; Stephen Matousek, and Ulrich H. Koch, both of Moraga, Calif., assignors to Whitey Research Tool Co., Emeryville, Calif.

Filed Oct. 15, 1973, Ser. No. 406,272
Int. Cl.² F16K *5/06, 41/04*
U.S. Cl. 251—288 **4 Claims**



1. A valve having a body defining a valve chamber with a rotary valve member mounted therein and an operating stem extending out of the body, the improvement comprising:

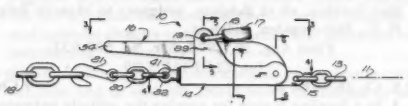
first and second stop surfaces on the exterior of said valve, said surfaces being positioned on laterally opposite sides of said stem and defined by radially opposite sides pf an integrally formed rib extending longitudinally of said body from both sides of said stem; and,

a handle having a uniform thickness throughout its length connected to said stem for rotation thereof between first and second spaced points, said handle including first and second depending stop members bent downwardly from the plane of said handle along lines which are generally perpendicular to each other and with said first stop member formed on the end of said handle and said second stop member formed on the side of said handle, each of said stop members having inner and outer surfaces and front and rear edges, said front edge of said first stop member being positioned to engage said first stop surface at said first position of rotation with said inner surface of said second stop member laterally spaced from said second stop surface and said front edge of said second stop member being positioned to engage said second stop surface at said second position of rotation with said inner surface of said first stop member laterally spaced from said first stop surface, each of said stop members being located such that when said front edges engage their respective stop surfaces, the contact forces act parallel to the plane in which the line of bend of the respective stop member lies.

3,954,252
OVERCENTER LOAD BINDER

Stanley E. Lyons, 18003 Galatea, Azusa, Calif. 91702

Filed Sept. 2, 1975, Ser. No. 609,190
Int. Cl.² B66F *3/00*
U.S. Cl. 254—78 **8 Claims**



1. An overcenter load binder for interconnecting two members and tightening them toward one another, comprising:

a first tension element adapted to be connected to one of said members and having a bifurcated portion defining two spaced arms;

a second tension element adapted to be connected to the other of said members;

an actuating lever having a swinging handle portion at one end thereof;

first pivotal connection means attaching said lever toward a second end thereof to said first tension element for relative swinging movement about a first pivotal axis between a load tightening position in which an intermediate portion of said lever between said handle and said first axis is received between said two arms of said first tension element, and a released position; and

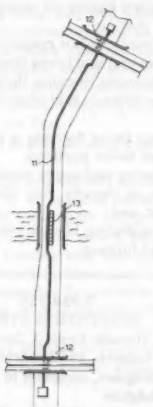
second pivotal connection means attaching said second tension element to said lever for relative pivotal movement about an axis offset from said first pivotal axis at a location to pull said members relatively together and be slightly overcenter with respect to said first axis when the lever is in said load tightening position;

said two arms of said first tension element having portions projecting outwardly beyond said intermediate portion of said lever in said load tightening position thereof and containing aligned apertures adapted to receive a locking part in a position of extension through said apertures and across an outer side of said intermediate portion of said lever between said arms in a relation blocking swinging movement of said lever from said load tightening position to said released position.

3,954,253
SAFETY BARRIER INCLUDING A METHOD FOR ERECTING THE SAME

Henri Morel, Louveciennes, and Michel Sere de Lanauze, Saint-Cloud, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Feb. 5, 1974, Ser. No. 439,826
Claims priority, application France, Feb. 27, 1973, 73.07236
Int. Cl.² E04H *17/02;* **E01F** *15/00*
U.S. Cl. 256—13.1 **9 Claims**



1. A safety barrier for use along highways comprising:

at least one cable, wherein said cable includes a central core of parallel synthetic textile yarns surrounded by an outer protective layer;

spaced supports for supporting the cable in vertical spaced relation from the highway

retaining means for securing the cable on the spaced supports, wherein the retaining means includes on each support a pair of vertically projecting flanges, between which the cable is mounted and a loop of strap iron positioned between the flanges and around the cable, wherein

a portion of the loop includes rupture means which ruptures upon impact against said cable, allowing said cable to remain in vertical spaced relation after impact, and

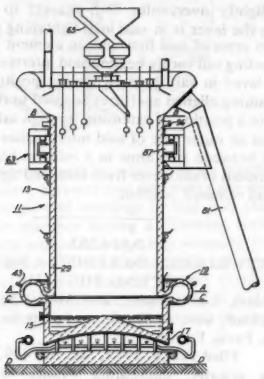
means secured to opposite ends of the cable for tensioning the cable over the support means.

3,954,254

METALLURGICAL FURNACE

Robert E. Zimmermann, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 16, 1975, Ser. No. 568,618
Int. Cl.² C21B 7/16
U.S. Cl. 266—188 13 Claims



1. A metallurgical furnace for producing molten metal from ore, wherein the improvement comprises:

a. a refractory shell having an upper portion spaced apart from a lower portion;

b. a refractory-lined conduit connected to and surrounding both said upper and said lower shell portions, said conduit having a continuous opening therein in communication with the space between said upper and lower portions and with

c. said refractory lining forming a venturi throat between said upper and lower portions;

d. means for moving said upper portion with respect to said lower portion to thereby vary the cross section of said venturi throat; and

e. means for distributing blast air in said conduit so that it flows into said furnace.

3,954,255

SUSPENSION STRUT

Johan H. Keijzer, Hasselt; Louis J. Jossa, Sint-Truiden; Henri C. J. Vanhove, Gelmen, and Francois J. G. Meuleman, Bettincourt, all of Belgium, assignors to Monroe Belgium N. V., Sint-Truiden, Belgium

Filed Aug. 30, 1974, Ser. No. 501,976
Int. Cl.² B60G 11/56
U.S. Cl. 267—34 14 Claims

1. In a vehicle suspension for a vehicle having sprung and unsprung portions,

a combination shock absorber and adjustable leveling strut having a body comprising a telescopic shock absorber having a cylinder and a reciprocal piston and piston rod,

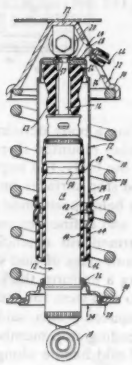
attachment means for securing said piston rod to one of the vehicle portions and said cylinder to the other of said vehicle portions,

first and second spring seats spaced axially of said strut and spaced radially outwardly from said shock absorber,

said first spring support being fixedly secured relative to said sprung portion of the vehicle and said second spring support being fixedly secured directly to the body of said strut,

a helical coil spring arranged substantially concentrically of said shock absorber and extending axially between and supported by said spring seats, whereby said shock absorber and spring may be removed from a vehicle as a unit and without requiring disassembly of the spring from around the shock absorber,

an elongated cylindrical dirt shield extending around the outer periphery of said piston rod and said cylinder and secured at one end thereof for telescopic movement relative to said cylinder, said dirt shield being located



radially between the outer periphery of said cylinder and the inner periphery of said spring,

a generally tubular-shaped flexible diaphragm member disposed between the radially outer side of the shock absorber and the radially inner side of said coil spring,

said diaphragm member defining a variable volume gas chamber with said dirt shield and including a radially inner part sleeved directly upon and secured to a portion of the outer periphery of said cylinder,

a radially outer part secured to said dirt shield and an integral rolling reversely folded part connecting said radially inner and outer parts, and

means defining a fluid passage for selectively supplying pressurized gas to and from said chamber to effect expansion and contraction thereof.

3,954,256

SUSPENSION SYSTEM FOR AUTOMOTIVE VEHICLES AND THE LIKE

Johan H. Keijzer, Hasselt; Louis J. Jossa, Sint-Truiden; Henri C. J. Vanhove, Gelmen, and Gilbert M. E. J. Van de Voorde, Sint-Truiden, all of Belgium, assignors to Monroe Belgium N. V., Sint-Truiden, Belgium

Filed Aug. 30, 1974, Ser. No. 502,032
Int. Cl.² F16F 5/00
U.S. Cl. 267—64 R 9 Claims

1. In a leveling system for varying the attitude between the sprung and unsprung portions of a vehicle,

a leveling strut comprising a pressurized shock absorber having an elongated tubular pressure cylinder,

a valved piston reciprocally disposed within said cylinder and connected to a piston rod extending axially from one end of said cylinder,

a rod guide and seal assembly disposed with said one end of said cylinder for guiding said piston rod for reciprocable movement relative to said cylinder,

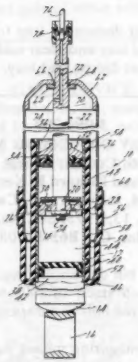
said one end of said cylinder being at least partially deformed radially inwardly to retain said rod guide and seal assembly in its operative position within said cylinder,

a floating piston disposed with said cylinder between said valved piston and the end of said cylinder opposite that from which said piston rod extends,

a quantity of pressurized gas located within said cylinder between said floating piston and said opposite cylinder end,

a quantity of damping fluid located within said cylinder on the opposite side of said floating piston from said gas and cooperable with said valved piston to damp said reciprocable movement of said piston rod relative to said cylinder,

first attachment means for securing the axially outwardly extending end of said piston rod to one of said vehicle portions and second attachment means for securing said opposite end of said cylinder to the other of said vehicle portions,



means including a resilient tubular diaphragm element defining a variable volume chamber at least partially surrounding said pressure cylinder,

said element including first and second end portions connected by an integral reversely folded portion,

said first end of said element being sleeved over said deformed one end of said cylinder and being contiguously engaged with the outer surface of said cylinder and having the terminus end portion thereof fixedly secured to said cylinder directly radially adjacent said deformed one end thereof,

a dirt shield arranged concentrically of said pressure cylinder, one end of said dirt shield being connected to said piston rod,

said second end portion of said element being spaced radially outwardly from said first end portion thereof and connected to the radially outer side of said dirt shield, and

means for selectively communicating a source of pressurized gas to and from said chamber to effect expansion and contraction of said chamber.

3,954,257

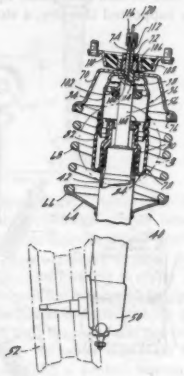
SUSPENSION STRUT

Johan H. Keijzer, Hasselt; Louis J. Jossa, Sint-Truiden, and Henri C. J. Vanhove, Gelmen, all of Belgium, assignors to Monroe Belgium N. V., Sint-Truiden, Belgium

Filed Aug. 30, 1974, Ser. No. 501,977

Int. Cl.² F16F 5/00

U.S. Cl. 267—65 R **20 Claims**



1. A leveling system for a vehicle having sprung and unsprung portions and comprising;

at least one leveling strut including a tubular housing,

a shock absorber cartridge including a piston and cylinder assembly telescopically received in said housing, a reciprocal piston rod and

attachment means securing said piston rod to one of the vehicle portions and said housing to the other of said vehicle portions,

an annular retaining collar disposed adjacent the upper end of said housing and releasably secured thereto for removably retaining said shock absorber cartridge within said housing, with said collar being selectively disengageable from said housing to permit convenient axial withdrawal of said cartridge from said housing for purposes of repair, replacement and the like,

a flexible diaphragm in part defining a variable volume fluid chamber,

said diaphragm comprising radially spaced inner and outer parts connected by an integral reversely folded rolling part, said radially outer part being connected against movement relative to said piston rod, said rolling part being directly in contact with the outer surface of said housing, and said radially inner part being connected to said collar and removable from said housing therewith to permit withdrawal of said cartridge from said housing, and

means for selectively communicating pressurized fluid to and from said chamber to effect expansion and contraction thereof.

3,954,258

SECOND FOLD ROLLER MOUNTING AND ADJUSTMENT MEANS

Eugen Skipor, Chicago, and Norman A. Brabec, Riverside, both of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

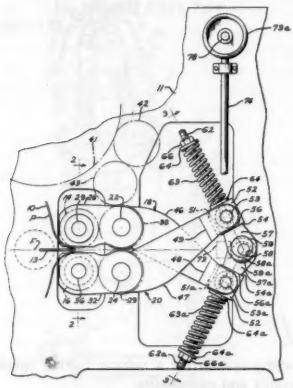
Filed Mar. 24, 1975, Ser. No. 561,081

Int. Cl.² B65H 45/18

U.S. Cl. 270—67 **5 Claims**

1. In a printing press folder mechanism having a folding cylinder, a folding blade, and a pair of parallel fold rollers defining a fold plane for receiving products tucked therebe-

tween by said folding blade and for advancing said products along a predetermined fold line, the improvement comprising two mounting units supporting opposite ends of the fold rollers, each unit inturn including a pair of levers mounted for pivoting motion about spaced, parallel axes and having first arms for supporting said fold rollers on opposite sides of and for movement toward and away from said fold plane, second, laterally inclined arms on said levers having free ends thereof disposed on the side of said fold plane opposite with respect to the fold roller supported thereby, a stop member for each



one of said pair of levers, said stop members being located between the free ends of said second arms and having coaction therewith to limit the movement of said fold rollers toward said fold plane, resilient spring means mounted on said stop members and adapted to bias the free ends of said second arms toward the respective stop members under a predetermined pressure, and control means for adjusting the respective stop members, levers and resilient spring means as integral units in unison and in opposite directions to thereby vary the positions of said fold rollers relative to said fold plane.

3,954,259

DOUBLE BAR SEPARATOR FOR A SHEET RECEIVING TRAY

Dennis P. Gerbasi, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1974, Ser. No. 527,108
Int. Cl.[2] B65H *31/26*
U.S. Cl. 271—4 **2 Claims**

1. An automatic document handler adapted for placing documents from a document stack onto a platen of a reproduction machine and removing the document therefrom after the document has been copied including:

a document tray adapted to receive a stack of documents to be copied;

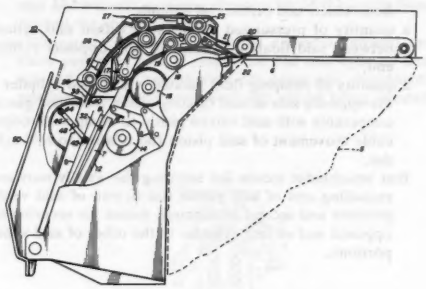
means for feeding documents sequentially from said document tray to the platen of the copy machine and returning the documents thereto;

means defining a return document path from the platen of the copy machine to the document tray;

two parallel rods;

linking means connecting said rods at the ends thereof; and

pivot means connected to said linking means, the axis of said pivot means being parallel to said rods at a location midway between said rods, said rods and linking means defining a throat for receiving individual documents therein, said rods and said linking means being located near the trail edge of a document when the document is fully fed therein, rotation of said linking means through an arc of 180° causing one of said rods to pass over the trail edge of the document in said throat, the other rod forcing the document against the previously received



documents in said document tray to positively hold said documents in said tray and clear said throat for receipt of the next document fed to said tray.

3,954,260

PAPER MONEY DISPENSING MECHANISM

Herbert Morello, North Canton; George S. Mountford, Chippewa Lake Village, and Richard E. Keck, Akron, all of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed Feb. 13, 1975, Ser. No. 549,850
Int. Cl.[2] B65H *5/08*
U.S. Cl. 271—12 **20 Claims**

1. In paper money bill dispensing mechanism wherein bills are transferred from a stack of bills to adjacent conveyor means which delivers the bills to a dispense station, the combination of

movably mounted magazine means storing a stack of bills;

rotary bill suction pick-up means including a rotor having a circumferential wall with an outer surface and elongated bill pick-up slot means formed in said wall;

main drive means for rotating the rotor;

the suction pick-up means including a source of suction having suction on communication with the slot means;

bill peeler means operatively connected with the main drive means normally engaged with the rotor and movable by the main drive means selectively to rotor disengaged position;

means for holding bills picked up by the rotor securely to said outer rotor surface at least during partial revolution of the rotor;

means operatively connected with the main drive means and magazine means for moving the magazine means from a normal rotor disengaged position to a position engaging an end portion of the top bill in the stack stored in said magazine means with said outer rotor surface; and

the operative connections between the main drive means, bill peeler means, and magazine means, being synchronized with suction on, to establish related conditions of bill peeler means disengaged position, and engaged magazine means position to engage an end portion of said top bill with the outer rotor surface;

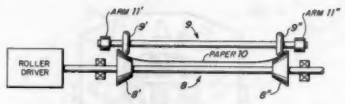
whereby during rotor rotation the pick-up means withdraws the top bill from the stack when said top bill is engaged by the slot means and the withdrawn bill wraps around and is held to the outer rotor surface.

3,954,261

INKED PAPER TRANSPORT MECHANISM EMPLOYING A PAIR OF BEVELED ROLLERS

Robert I. Greene, Rochester, and Thomas M. Madigan, Pittsford, both of N.Y., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 3, 1975, Ser. No. 538,485
Int. Cl.² B65H 29/70
U.S. Cl. 271—188 11 Claims



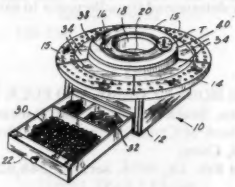
1. An inked paper transport mechanism comprising:
a. a first pair of beveled drive rollers; and,
b. a second pair of drive rollers for driving inked sheets between said first pair of drive rollers and said second pair of drive rollers, said second pair of drive rollers having rounded peripheries biased against the beveled portions of said first pair of drive rollers, said inked sheets having inked portions contacting said rounded peripheries of said second pair of drive rollers.

3,954,262

GAME DEVICE

Leonard J. Weber, Broadview, Ill., assignor to Ronald J. LaPointe and Richard Lee Caldwell, part interest to each

Filed July 14, 1975, Ser. No. 595,599
Int. Cl.² A63F 9/16
U.S. Cl. 273—1 E 15 Claims



15. A game device comprising:
a game board including a plurality of recesses for receiving play pieces therein;
a pair of slightly spaced metal electrically conducting members having upper surfaces which are canted downwardly toward each other to define a trough-like structure;
insulating means disposed between said metal members, and defining the bottom of said trough-like structure for insulating said metal members from each other;
a hopper for containing play pieces formed in said game board;
electrically actuated indicating means operatively associated with said game device for indicating the end of play;
electrical circuitry associated with said game board and adapted to be connected to an electrical power source and said electrical circuitry being connected to said pair of metal members and said indicating means, said electrical circuitry being adapted to activate said indicating means when the electrical circuit is closed by placing a conductor across said pair of metal members.

3,954,263

GROWTH MATERIAL AND GROWTH TEE

James D. Whelan, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Apr. 8, 1974, Ser. No. 458,907
Int. Cl.² A63B 57/00
U.S. Cl. 273—33 2 Claims

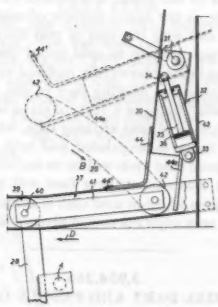
1. A golf tee molded from a material comprised of grass seed, plant food and a cellulose carrier binder wherein the plant food and binder includes fertilizer and enriched soil in combination with a moisture proof exterior coating enclosing said material, wherein said coating is stiffer and harder than said material and wherein the combined hardness and stiffness of the coating and material is sufficient for ground insertion and to support a golf ball thereon, said tee having a ball-supporting head and a tip narrower than said head for ground insertion, said tip including a central bottom opening which flares outwardly and downwardly whereby the coating surrounding the opening is breakable upon insertion of said tip in the ground due to the pressure exerted by the earth upon insertion.

3,954,264

BOWLING PIN SWEEPER APPARATUS FOR AUTOMATIC BOWLING ALLEYS

August Schmid, Schwerzenbach, Switzerland, assignor to Patentverwertungs-und Finanzierungsgesellschaft Serania AG, Glarus, Switzerland

Filed Dec. 23, 1974, Ser. No. 535,698
Claims priority, application Switzerland, Dec. 27, 1973, 18134/73
Int. Cl.² A63D 5/00
U.S. Cl. 273—54 A 15 Claims



1. Bowling pin sweeper apparatus for automatic bowling alleys comprising
a pin sweeper arm (28), essentially horizontal guide rails (37) guiding the arm (28) for receiprocating sweeping movement, means (26, 1, 2, 3) holding the arm (28) in

raised position, said arm being lowered for subsequent movement along the guide rails, upon initiation of the sweeping cycle including a holding hook (2) pivotable about an essentially horizontal axis (3), and a vertically movable frame (26) normally in raised position with respect to the rails (37), said frame being movable to drop to a position in which the hook (2) can engage the sweeper arm (4, 28) upon termination of the sweeping cycle of the sweeper arm, and raise the sweeper arm preparatory for subsequent dropping thereof upon initiation of the next operating cycle;

electromagnet means (19) connected to the holding means (26, 1, 2, 3) which, upon energization, are operable to rapidly release the arm (28) to permit dropping by gravity and rapid lowering thereof; and

two-part locking means (13, 9), one of said locking means parts (13) being connected to said hook (2) and movable therewith, the other of said locking means part (9) being operatively connected (20-24) to said electromagnetic means and operated thereby upon energization thereof to unlock said locking means and release the hook (2).

3,954,265

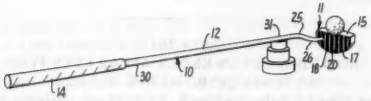
BALANCED GOLF CLUB

David L. Taylor, 380 W. Carmel Valley Road, Carmel Valley, Calif. 93924

Filed Oct. 10, 1974, Ser. No. 513,564

Int. Cl.² A63B *53/02*

U.S. Cl. 273—80 C **4 Claims**



1. A golf club used for the putting stroke having a shaft, a grip mounted at one end of said shaft and a head mounted at the other end provided with a striking face, a toe portion, a heel portion, and a rear portion, said shaft having reverse curves at the lower portion thereof adjacent the point of attachment in said head, said head having a receiving hole for permantly mounting said shaft angled downwardly upward toward the toe thereof and downwardly rearward away from the striking face of the head, said reverse curves lying in the same axial plane as the upper portion of said shaft and rearwardly thereof and with the axis of said lower portion being angularly disposed relative to said upper shaft portion, said same axial plane being rearwardly inclined relative to a vertical plane normal to the striking face of the club, said upper portion of said shaft being in a vertical plane in advance of and parallel to the plane of said striking face, whereby with said receiving hole being as angulated and said reversed curves being so positioned said club will be in its balanced mounting alignment such that said striking face will be upturned and parallel to the ground when said club is horizontally balanced at its balancing area adjacent to and above said reverse curves.

3,954,266

AERIAL DART AND PADDLE GAME

Andrew J. Carrano, North Haven, Conn., and Albert Saferstein, Pelham Manor, N.Y., assignors to Codemark Industries, Inc., Wallingford, Conn.

Filed Mar. 8, 1974, Ser. No. 449,542

Int. Cl.² A63B *71/02*

U.S. Cl. 273—95 R **9 Claims**

1. An aerial dart game comprising:

A. a dart incorporating a suction cup at its end; and

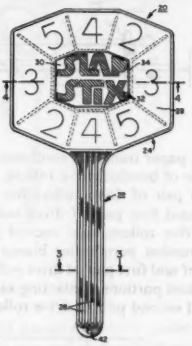
B. a unitary molded target face incorporating:

a. a dart-adhering surface for receiving and holding the suction cup of the dart thereto, and comprising:

1. a major area of said target face extending about the periphery of said target face, and

2. a plurality of zones each having indicia market thereon for assessing a score to a player for having the said dart land on said dart-adhering surface,

b. a dart-rejecting surface centrally located on said face for preventing adherence thereto of the suction cup of the dart, and



c. a continuous ridge

1. peripherally surrounding said dart-rejecting surface forming a precise demarcation between said dart-rejecting surface and said dart-adhering surface, and

2. cooperating with said dart-rejecting surface to prevent adherance of any dart straddling said ridge into said dart-rejecting surface,

whereby adherence of said suction cup to said target face while substantially within non-adhering zone is prevented and a score is readily determined for adherence to said dart-adhering surface.

3,954,267

AIR POWERED HOCKEY GAME AND PUCK THEREFOR

Richard Freeman, South Windsor, and Norbert L. Reiner, Wallingford, both of Conn., assignors to Coleco Industries, Inc., Hartford, Conn.

Filed Feb. 10, 1975, Ser. No. 548,629

Int. Cl.² A63F *3/00*

U.S. Cl. 273—126 A **6 Claims**

1. A game providing rapid and diverse game action comprising:

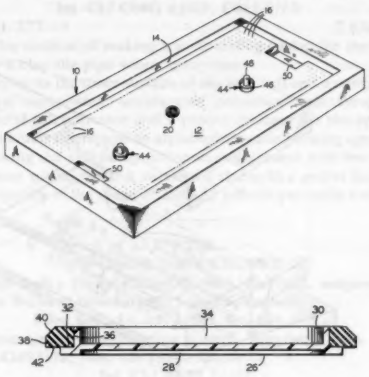
a. a game table having a planar playing surface and boundary walls extending thereabout of relatively rigid material, said planar playing surface having a pattern of closely spaced perforations therein, said game table further including means for supplying air under pressure and conduit means communicating with said perforations to provide jets of air issuing from said perforations; and

b. a puck comprising:

1. a body member of relatively rigid synthetic resin and generally circular cross section having a continuous disc portion with upper and lower surfaces and with a coaxial circular recess extending upwardly in the lower surface thereof and upstanding annular wall extending upwardly from the upper surface of said disc portion and spaced inwardly from the periphery thereof to provide a horizontally disposed annular shoulder thereabout and a cavity therewithin, said annular wall having substantially vertical faces; and

2. an annular bumper member of resiliently deformable synthetic resin seated about said annular wall and on

said annular shoulder, said annular bumper member being of a width greater than the width of said shoulder so as to project outwardly of the periphery of said body member for engagement with the boundary walls of said game table, said puck recess being dimensioned to overlie a multiplicity of said game table perforations



and thereby entrap air issuing therefrom to offset the combined weight of said body member and annular bumper member, whereby said puck member will slide essentially frictionlessly on said playing surface and will resiliently rebound from said boundary walls upon impact thereagainst.

3,954,268

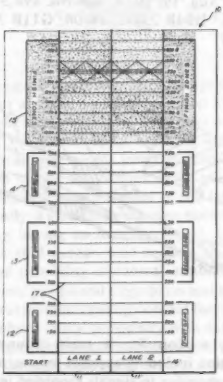
DRAG RACING GAME APPARATUS

Gregory J. Zyla, P.O. Box 185, Pillow, Pa. 17080

Filed Dec. 13, 1974, Ser. No. 532,734

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—134 CA **5 Claims**



1. In an automobile racing game:

a. a playing board divided into a plurality of parallel paths;

b. each of said paths being divided into a plurality of zones and bearing spaced distance indicia;

c. a plurality of playing pieces equal in number to the number of said paths for advancing along each said paths in discrete steps through each of said zones;

d. a plurality of control means each bearing indicia including numbers simulating the racing performance characteristics of a different automobile, for controlling the advance of each of said playing pieces through each of said zones in accordance with said racing performance characteristics; and

e. means for randomly selecting one of the numbers on said control means.

3,954,269

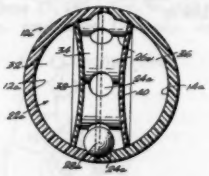
INDICIAED BALL HAVING LOOSE INTERIOR WEIGHT

Vertner David Brittingham, c/o W. C. Brittingham, 1722 Beacon Hill Road, Lexington, Ky. 40504

Filed Apr. 28, 1975, Ser. No. 572,285

Int. Cl.[2] A63B *71/06;* **A63F** *9/04*

U.S. Cl. 273—138 R **1 Claim**



1. A symbol indicating device comprising a generally ball shaped object formed of two halves fixed together by a suitable adhesive means and providing a plurality of symbols disposed about the exterior surface thereof, a hollow, chamber defining interior and a pocket in said interior chamber diametrically opposite each of said symbols, and weight means freely disposed in said interior chamber to settle in any one of said pockets, when said ball shaped object comes to rest after movement thereof, to move said one pocket to the bottom of said chamber by gravity forces, thereby positioning the diametrically opposite symbol atop said exterior surface, said plurality of symbols being disposed in a single circumferential line about said exterior suface, said hollow, interior chamber being provided with a pair of spaced apart, opposed, inwardly convex discs, each fixed by a suitable adhesive to said interior to define a circumferential chamber therebetween corresponding to said single circumferential line, said weight means being freely disposed in said circumferential chamber.

3,954,270

GOLF CLUB

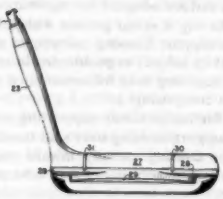
Raymon W. Cook, San Antonio, Tex., assignor to Ray Cook Golf Putters, Inc., San Antonio, Tex.

Division of Ser. No. 867,107, Sept. 10, 1969, Pat. No. 3,884,468. This application Aug. 12, 1974, Ser. No. 496,452

The portion of the term of this patent subsequent to May 21, 1982, has been disclaimed.

Int. Cl.[2] A63B *53/04*

U.S. Cl. 273—164 **12 Claims**



1. In a golf club head consisting of an upstanding blade having a front face and a rear face with a flange extending rearwardly of the said blade, said flange having a top and rear face, a longitudinally and horizontally extending groove in the

rear face of said blade extending completely across the rear face thereof, a flange groove extending downwardly into the top of said flange to an approximate uniform depth and terminating rearwardly substantially across the entire rear face of said flange, said flange groove communicating with said longitudinally and horizontally extending groove, first and second spaced and parallel alignment grooves being disposed transverse to the longitudinal axis of said club head and extending downwardly into said blade.

3,954,271

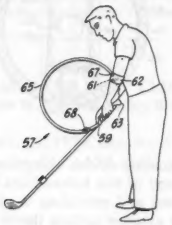
GOLF CLUB SWING TRAINING DEVICE

Wynn B. Tredway, Sr., P.O. Box 130, Freeport, Pa. 16229

Division of Ser. No. 368,814, June 11, 1973, Pat. No. 3,863,933. This application Nov. 19, 1974, Ser. No. 525,211

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—186 A **5 Claims**



1. A training apparatus for indicating when a pupil properly positions a golf club comprising:

a. a shaft having a gripping portion held and maneuvered by said pupil;

b. an arcuate member mounted to said shaft and curving toward said gripping portion;

c. an electrical contactor worn upon one arm of said pupil;

d. an electrical indicator in circuitry with said arcuate member and said contactor whereby when said shaft is properly positioned as a golf club at the top of the backswing, said arcuate member contacts said electrical contactor and said indicator is actuated to indicate the proper position of said shaft.

3,954,272

SIGNAL PICKUP RETURN MECHANISM

Marvin Allan Leedom, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 10, 1975, Ser. No. 557,179

Int. Cl.[2] G11B *3/10*

U.S. Cl. 274—23 A **8 Claims**

1. In a playback system including a base and a cover, a turntable mounted for rotation relative to said base, said turntable having a surface adapted for receiving a disc record, said disc record having a spiral groove with information recorded therein, a support housing carrying a signal pickup, and said signal pickup subject to positioning in relation to said spiral groove for scanning said information; a signal pickup return mechanism comprising:

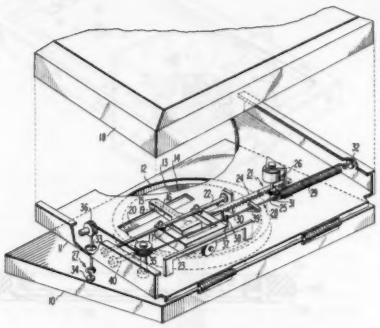
bearing means for reciprocably supporting to-and-fro motion of said support housing over said turntable;

drive means for causing radially inward motion of said support housing for scanning of said information by said signal pickup;

extendible cord means having its ends respectively secured to said base and said cover, wherein said cord means extend as said cover is lifted away from said base; and

engaging means affixed to said extendible cord means to the exclusion of said support housing; and

wherein the location of said engaging means relative to said support housing is such that said engaging means is (1) subject to engagement with said support housing during radially outward motion of said engaging means as said cover is lifted away from said base, said engaging means being effective only in causing radially outward movement of said support housing, and (2) subject to disengagement from said support housing during radially inward motion of said support housing when said cover is closed, said engaging means permitting without hindrance radially inward movement of said support housing when said cover remains closed, while urging said support housing to return to a rest position as said cover is lifted away from said base.



3,954,273

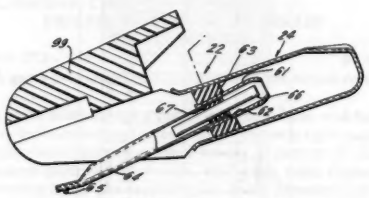
PHONOGRAPH PICKUP CARTRIDGE

Harry B. Shaper, East Hills, and Donald G. Litcher, Commack, both of N.Y., assignors to Empire Scientific Corporation, Garden City, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,513

Int. Cl.[2] H04R *23/02, 19/06;* **G11B** *3/02*

U.S. Cl. 274—37 **13 Claims**



1. A moving section for a multi-channel phonograph pickup; said section including support means; a first vibratory system driven responsive to signals recorded in a phonograph record groove; said first vibratory system including a stylus, armature means, a member connecting said stylus to said armature means whereby movement of said stylus will drive said armature means, and resilient means supporting said armature means on said suppot means for vibratory motion with respect thereto; a second vibratory system including mass means, and another resilient means supporting said mass means on said first vibratory system for vibratory motion with respect thereto.

3,954,274

CLAY TILE PIPE JOINT SEAL CONTAINING FOAMED UNSATURATED POLYESTER RESIN

Eugene J. Grandlic, Sheboygan, and Stanley N. Korb, Port Washington, both of Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed Oct. 21, 1974, Ser. No. 516,821

Int. Cl.² C08G 63/02; C08J 9/10

U.S. Cl. 277—1 **7 Claims**

1. The method of making a joint sealing gasket for the bell end of a clay tile pipe which comprises:

applying to the inner surface of the said bell end a composition comprising: unsaturated polyester resin syrup, a metal salt activator and a peroxy initiator for the syrup, and inert fillers, and an alphahydroxy azo blowing agent,

retaining the said composition in engagement with the said inner surface until it cures to a sleeve-like gasket having a density in the range of 25 to 65 pounds per cubic foot.

3,954,275

MACHINE TOOL CHUCKS

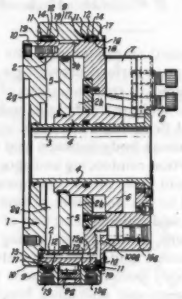
Kenneth Bailey Philip Pickles, Halifax, England, assignor to Pratt Burnerd International Limited, England

Filed Sept. 11, 1973, Ser. No. 396,133

Claims priority, application United Kingdom, Sept. 13, 1972, 42495/72; Nov. 10, 1972, 52059/72

Int. Cl.² B23B 31/30

U.S. Cl. 279—4 **15 Claims**



1. A fluid pressure operated chuck comprising a chuck body rotatable about an axis, a piston mounted in the chuck body for axial displacement therein, a set of jaws mounted for radial movement on the chuck body between work clamping and work release positions, means interconnecting said set of jaws and said piston so that the former move to at least one of its positions in response to movement of the latter, valve means in the chuck body; a stationary slip ring surrounding the chuck body, said ring having an annular recess, a resilient sealing ring housed in said recess, said sealing ring having a cross sectional shape providing a central annular sealing contact face and marginal peripheral edge parts and at least one opening in the central annular sealing contact face; annular passage means in the chuck body in registry with said annular recess and said sealing ring and communicating with a working face of said piston through said valve means, said central annular sealing contact face being forced under fluid pressure into face-to-face contact with the chuck body during actuation of the piston, so that the fluid power may pass from the annular recess in the slip ring, through the opening in the central annular sealing contact face, through the passage means in the chuck body and the control valve means; marginal grooves being provided in the slip ring on either side of said recess, the marginal peripheral edge parts of said sealing ring being tightly fit in said marginal grooves, said sealing ring being of such width and resilience that said edge parts spring into engagement with the marginal grooves, said contact face having a concave annular profile relative to the chuck body in the absence of fluid pressure in the recess on the side of the sealing ring remote from said face, said annular recess in the slip ring comprising a dove-tailed cross sectional portion with which the marginal edge parts of the sealing ring engage so that the sealing ring normally assumes a substantially concave-convex cross-sectional formation.

3,954,276

IMPACT DEVICE

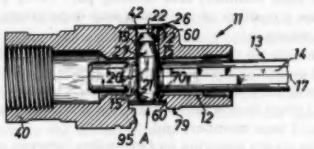
Rudolf Koniger, Buchholz-Batzenhausle; Jurgen Heuenburg, Emmendingen; Albert Frischmann, Freiburg, and Kurt Mermi, Emmendingen, all of Germany, assignors to Upat-Max Langensiepen KG, Emmendingen, Germany

Filed June 27, 1974, Ser. No. 483,666

Claims priority, application Germany, Apr. 24, 1974, 2419631

Int. Cl.² B23B 31/08

U.S. Cl. 279—97 **19 Claims**

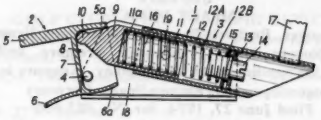


1. In an impact device, particularly a hammer-drill or the like, a combination comprising a chuck having a first bore adapted to accommodate a shank of a tool bit, and a second bore which intersects said first bore and has terminal portions that extend through a circumferential wall of said chuck at diametrally opposite locations and which each have an open end, said chuck further having an outer circumferential surface and an inner circumferential surface each of which encircles said first bore and one of which is formed with a circumferentially extending groove formed internally with a flat facet and traversed by said second bore; a tool bit having a shank receivable in said first bore and which is provided with a surface recess transverse to the elongation of said first bore; a locking stud received and axially shiftable in said second bore between a tool-locking position in which it extends through said recess and a tool-releasing position in which it is retracted out of said recess, said stud having a center portion of maximum diameter which extends across said first bore and in part into the respective terminal portions when said stud is in said tool-arresting position so that forces are transmitted between said chuck and said tool bit via said center portion; and arresting means for normally arresting said stud in said tool-locking position and operable for releasing said stud for movement to and from said tool-releasing position, said arresting means comprising a spring element in form of a circumferentially incomplete annular leaf spring received in said groove and having two end portions defining with one another a gap and at least one of which is provided with a flat surface resting on said facet, said leaf spring extending circumferentially of said chuck blocking both of said open ends and being displaceable to unblock the other of said open ends for insertion and extraction of said stud, at least one of said end portions of said leaf spring at least in part overlying said other open end, said leaf spring being provided with an aperture smaller than but registering with said one open end.

3,954,277
SKI BINDING

Gottfried Schweizer, and Franz Hrachowitz, both of Vienna, Austria, assignors to Gertsch AG, Zug, Switzerland

Filed Mar. 3, 1975, Ser. No. 554,438
Claims priority, application Austria, Mar. 22, 1974, 2418/74
Int. Cl.² A63C 9/08
U.S. Cl. 280—631 **10 Claims**

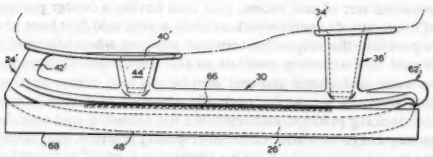


1. A ski binding, comprising:
a base member;
a holding part for engaging a boot sole, said holding part having elongated guideway means thereon having first and second spaced limits;
first pivot means for pivotally securing said holding part to said base member, said holding part being pivotal between a position of use and a step-in position;
guide means;
operator means mounted on said guide means and engaging said guideway means and being movable over the length thereof between said first and second limits;
second pivot means for pivotally securing said guide means to said base member; and
resilient means engaging and extending between said operator means and said guide means for resiliently holding said operator means at least one of said limits corresponding to one of said position of use and said step-in position, said first and second limits being located on opposite sides of a theoretical straight line connecting said first and second pivot means, said operator means, when aligned with said straight line, being in a dead-center position whereby said resilient means urges said operator means to either one of said first and second limits on opposite sides of said straight line depending on the direction of force applied to said holding part by said ski boot.

3,954,278
ICE SKATE

Wallace John McLeod, Mississauga, Canada, assignor to Nylite Skate Company of Canada Limited, Markham, Canada

Filed Dec. 16, 1974, Ser. No. 532,786
Int. Cl.² A63C 3/12
U.S. Cl. 280—11.38 **1 Claim**

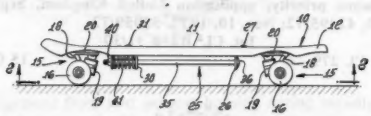


1. An ice skate comprising a skate body of a synthetic resin material, said body being attachable to a skate boot, and a blade attached to the body, said blade having a first portion formed with an ice contacting edge, a second portion having an upper edge and a pair of parallel sides between said edges, said second portion being imbedded in said body and being formed with a plurality of keying apertures which are spaced longitudinally along the blade, each of said apertures extending through the blade at a position remote from said upper edge whereby said upper edge is uninterrupted, said skate body being of one-piece molded construction and being shaped to define a channel which receives said second portion of the blade, said channel including a pair of laterally spaced side portions disposed proximate said blade sides, a longitudinally extending rib formed on each of said channel side portions and projecting laterally outwardly therefrom, and a blade protector adapted to be removably mounted upon said skate body, said blade protector comprising an elongated member generally coextensive in length with said blade and having a U-shaped cross-section open at the top and closed at the bottom, the open end of said member including a pair of laterally spaced and inwardly projecting flange portions extending longitudinally of said member, said blade being adapted to project within said protector such that said flange portions engage with said channel ribs to removably retain said protector upon the skate body.

3,954,279
RESILIENT SKATE BOARD

Herbert Guerr, 2128 W. 233rd St., Torrance, Calif. 90501

Filed May 5, 1975, Ser. No. 574,318
Int. Cl.² A63C 17/00
U.S. Cl. 280—87.04 A **1 Claim**



1. In a skate board an elastic, elongate body portion presenting a planar upper surface providing a foot rest, a pair of roller trucks secured to the underside of said body portion adjacent opposite ends thereof; said body portion being of such thinness and flexibility as to be incapable of supporting the weight of a human body between said roller trucks, and a resilient body-portion-reinforcing and shock absorbing assembly attached to said body portion comprising a pair of angle brackets secured to the underside of said body portion, one adjacent each of said roller trucks; one of said angle brackets having an aperture, a metal rod having an end extending through said aperture and extending between said brackets parallel to said body portion and spaced therefrom, a spring compressed between said apertured bracket and the end of said rod extending through said aperture, and means for adjustably varying the initial compression of said spring comprising a nut threaded on the end of said rod extending through said aperture.

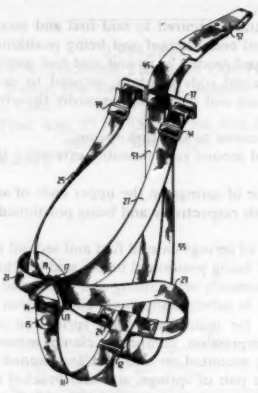
3,954,280
CHILD AUTO RESTRAINT HARNESS

Verne L. Roberts, 4131 Cobblestone Place, and James H. McElhaney, 3411 Cambridge Drive, both of Durham, N.C. 27707

Filed Oct. 15, 1974, Ser. No. 514,945
Int. Cl.² B60R 21/10
U.S. Cl. 280—744 **26 Claims**

1. A restraint harness for use by a child in a vehicle seat having a safety belt comprising a crotch strap terminating at one end forward of said child and extending underneath said child, a pair of waist straps extending about said child, the other end of said crotch strap being fixed to said waist straps, a rigid strap plate adjacent the vertical section of said seat behind the shoulders of said child, a plurality of slots in said strap plate of a size to accept said straps, an anchor strap affixed to said strap plate by being threaded through selected ones of said slots in said strap plate, said anchor strap passing over said waist straps for fixing said waist straps to said anchor strap and around said safety belt for fixing said anchor strap to said safety belt and between the horizontal and vertical sections of said vehicle seat, a clasp secured to said anchor

strap rearwardly of said automobile seat, means for securing said clasp to the associated vehicle, shoulder straps affixed to said anchor plate by being threaded through said strap plate



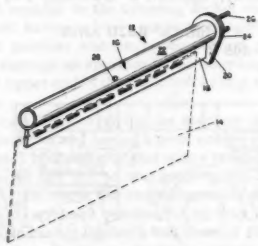
on either side of said anchor strap and buckle means for releasably securing said waist strap, said crotch strap, and said shoulder straps in front of said child.

3,954,281

MUDFLAP MOUNTING ASSEMBLY

Alfred R. Juergens, Muskegon, Mich., assignor to Fleet Engineers, Inc., Muskegon Heights, Mich.

Filed Feb. 24, 1975, Ser. No. 552,766
Int. Cl.² B62D *25/16*
U.S. Cl. 280—154.5 R **13 Claims**



1. In a mudflap assembly having a seat for attaching to a vehicle, a mudflap hanger assembly including means for mounting a mudflap thereon, means for resiliently mounting said hanger to said seat wherein said hanger assembly flexes under normal operation conditions, yet returns to abutting contact with the seat, the improvement which comprises:

said seat having an upper rimless flat portion and an elongated lower portion with guide means extending outwardly of said lower portion;

said hanger assembly further including a face plate shaped to fit snugly within said guide means when in seating contact with said seat and in only one predetermined orientation;

said resilient mounting means biasing said face plate into seating contact with said seat,

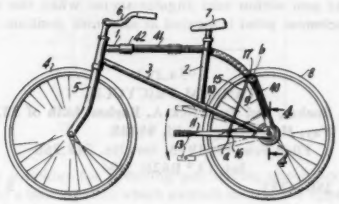
whereby said seat guides said face plate into said predetermined orientation with respect to said seat after flexing of said hanger assembly.

3,954,282

VARIABLE SPEED RECIPROCATING LEVER DRIVE MECHANISM

Douglas W. Hege, Huntington Beach, Calif., assignor to Hege Advanced Systems Corporation, Huntington Beach, Calif.

Filed July 15, 1974, Ser. No. 488,833
Int. Cl.² B62M *1/08*
U.S. Cl. 280—251 **12 Claims**



1. In a rider-driven vehicle having a frame and at least one driven wheel journalled in the frame for rotation with respect thereto, a variable speed drive mechanism of the type that includes

a rotatable driving member mounted for rotation with respect to the frame and having a first predetermined effective circumference;

unidirectional torque transmitting means connected between the driving member and the driven wheel for transmitting torque in only one direction from the driving member to the driven wheel;

an elongated lever arm;

means near one end of the lever arm for receiving a driving force exerted by a rider of the vehicle;

means attached to the lever arm near its other end for connecting the lever arm to the vehicle frame to permit oscillatory movement of the lever arm about its other end within a predetermined angular sector with respect to the frame in response to the driving force exerted by the rider;

anchor means mounted at one of a first attachment point connected to the lever arm intermediate the ends thereof and a second attachment point connected to the frame and lying approximately in the plane of oscillation of the lever arm and spaced to one side of the predetermined sector of oscillation;

a rotatable intermediate member mounted at the other of said first and second attachment points, the intermediate member having a predetermined effect circumference;

means for selectively changing the location of the second attachment point relative to the first attachment point for a given angular position of the lever arm so as to vary the angle between the lever arm and a line from the first to the second attachment point for the given angular position of the lever arm between predetermined limits, and

means connecting the anchor means to the rotatable driving member by way of the rotatable intermediate member for transforming a tensile force acting on the anchor means along a line from the anchor means tangent to the effective circumference of the rotatable intermediate member, in response to the driving force exerted by the rider on the force receiving means, into a force acting on the driving member tangent to its effective circumference, wherein the improvement comprises:

an arm pivotally attached at one end to a predetermined point on the lever arm intermediate the ends of the lever arm and having the first attachment point located at its other end and

a drag link having one end pivotally attached to the arm at a point spaced from the one end of the arm, the drag link extending approximately parallel to the lever arm and having its other end pivotally connected to the frame

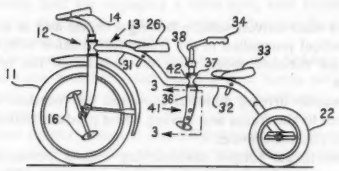
between the oscillatory axis of the lever arm and the nearest one of the predetermined limits of the means for selectively changing the location of the second attachment point so that the first attachment point describes an arc approximately centered at the location of said predetermined limit in response to oscillation of the lever arm within the predetermined angular sector, whereby the distance between the first and second attachment points remains substantially constant for all positions of the lever arm within said angular sector when the second attachment point is located at said limit position.

3,954,283

TANDEM TRICYCLE

Vera L. Boehm, and Frederick A. Boehm, both of 322 Twin Oaks Way, Healdsburg, Calif. 95448

Filed Feb. 10, 1975, Ser. No. 548,266
Int. Cl.² B62K *5/04*
U.S. Cl. 280—273 **5 Claims**



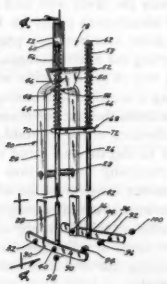
1. A tricycle comprising an elongated frame having a front steering wheel and a pair of laterally offset rear wheels mounted thereon with a front seat behind the front wheel, a rear seat mounted on said frame behind said front seat and ahead of said rear wheels, auxiliary handle bars pivotally mounted on said frame in extension upwardly therefrom between said seats and auxiliary pedals mounted on said frame below said auxiliary handle bars whereby a rider seated in said rear seat may grip said auxiliary handle bars and turn the handle bars to simulate steering and place his feet on said auxiliary pedals.

3,954,284

BICYCLE WHEEL SUSPENSION MEANS

Ronald F. Phillips, 4029 54th St., Des Moines, Iowa 50310, and Philip Carl Johnson, 318 NE. 5th St., Ankeny, Iowa 50021

Filed Feb. 28, 1975, Ser. No. 554,119
Int. Cl.² B62K *25/16*
U.S. Cl. 280—277 **3 Claims**



1. A suspension system for a bicycle having a frame with rearward and forward ends,

a fork means rotatably mounted on the forward end of said frame and having spaced apart first and second downwardly extending fork arms,

first and second arms pivotally secured to said first and second fork arms respectively and extending forwardly therefrom,

a wheel rotatably secured to said first and second arms at the forward ends thereof and being positioned between said first and second arms and said fork arms,

first and second rods pivotally secured to said first and second arms and extending upwardly therefrom respectively,

a bracket secured to said fork means,

said first and second rods movably extending through said bracket,

an upper pair of springs on the upper ends of said first and second rods respectively and being positioned above said bracket,

a lower pair of springs on said first and second rods respectively and being positioned below said bracket,

means for normally maintaining said upper and lower pairs of springs in substantially equal compression

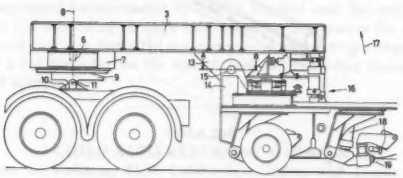
said means for maintaining said springs in substantially equal compression comprises clamp means vertically adjustably mounted on said first and second rods below said lower pair of springs, and said bracket comprises a horizontal base portion secured to said fork means at the upper end of said fork arms and extending forwardly therefrom, a substantially vertical intermediate portion extending upwardly from the forward end of said base portion, and a horizontal top portion extending forwardly from the upper end of said intermediate portion, said top portion having a pair of openings formed therein which receive said rods.

3,954,285

VEHICLE WITH A TRACTOR AND A TRAILER

Alois Goldhofer, Siechenreuteweg 22, 8941 Amendingen, Germany

Filed Nov. 12, 1973, Ser. No. 414,666
Claims priority, application Germany, July 24, 1973, 2337594
Int. Cl.² B62D *53/08*
U.S. Cl. 280—405 R **6 Claims**



1. A vehicle such as a tractor-trailer unit having a longitudinal axis and wherein the trailer has a plurality of axles having sets of wheels, each of which axles may be subjected to different loads, comprising: an articulated means pivotally coupled to the tractor or tow vehicle and having a hydraulic load compensation or equalizing device; said means being disposed between said tractor and said trailer vehicle and comprising a connecting bridge pivotally connected to said tractor along a first axis perpendicular to the longitudinal axis of said vehicle; said bridge being further pivotably connected to said tractor about a second axis oriented perpendicularly with respect to said first axis; and said bridge being pivotally connected to said trailer along an axis parallel to said second axis; said device comprising at least one hydraulic piston-cylinder arrangement, pivotably connected to said bridge and said trailer; and means for applying hydraulic pressure to said piston-cylinder arrangement which corresponds to the maximum load

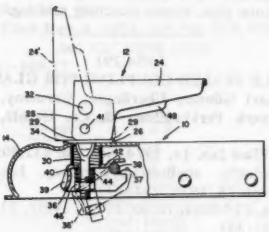
applied to any one of said plurality of axles to provide a desired saddle load and adequate ground holding force of the tractor vehicle may be controllably established: whereby said piston-cylinder arrangement is responsive to the maximum loading of said axles of said sets of wheels.

3,954,286

QUICK RELEASE TRAILER COUPLING

Bernard R. Weber, Elm Grove, Wis., assignor to Valley Tow-Rite, Lodi, Calif.

Filed Aug. 27, 1975, Ser. No. 608,131
Int. Cl.² B60D 1/06
U.S. Cl. 280—512 **3 Claims**



1. Apparatus for locking a coupling socket member in engagement with a mating ball member, said apparatus comprising:

a ball retainer member located at least partially within the coupling socket member, said ball retainer member being movable from a lowered release position to a raised locking position in engagement with the ball member to lock the ball member to the coupling socket member;

a latch bolt having a lower portion engaged with the ball retainer member and an upper portion projecting upwardly through an aperture in the coupling socket member, the upper end of the latch bolt having a notch formed therein;

a pivotal cam lever overlying the aperture in the coupling socket member and having a pivot end pivotably attached to the latch bolt and provided with a projecting cover and an opposite free end so that pivoting the cam lever in a first direction about the projecting cover moves the cam lever from a release position to an over center locking position and raises the latch bolt to move the ball retainer member from its lowered release position to its raised locking position, and pivoting the cam lever from its over center locking position to its release position lowers the latch bolt to move the ball retainer member from its locking position to its lowered release position;

a locking latch having a pivot end pivotably attached to the free end of the cam lever and having an opposite free end adapted to overlie the upper end of the latch bolt, said locking latch having a preselected length so that upon pivoting the cam lever in the first direction to its over center locking position, the free end of said locking latch is aligned with the notch in the upper end of the latch bolt; and

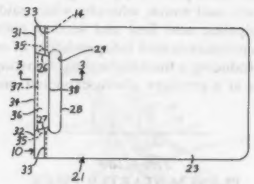
a spring bias means adapted to bias the locking latch toward the notch so that the free end of the locking latch snaps into engagement with the notch to lock the cam lever in its over center locking position, said locking latch being manually movable against the spring bias means to disengage the free end of the locking latch from the notch to allow the cam lever to pivot to its release position.

3,954,287

HOLDER FOR WRITING PAD

Belmont D. Osteen, Rte. 18, Box 85, Birmingham, Ala. 35210

Filed Dec. 19, 1974, Ser. No. 534,433
Int. Cl.² B42D 1/00
U.S. Cl. 281—15 R **2 Claims**



1. In a holder for a writing pad having sheets secured in place by a binding strip which extends around the upper edges of and laps over the top of said sheets to provide an overlapping free edge,

a. a cover for said pad having a front portion thereof extending over the upper side of said pad, a back portion extending along the lower side of said pad and an intermediate portion connecting said front and back portions.

b. a first flap-like member connected to said cover and extending over said binding strip and terminating adjacent said overlapping free edge of said binding strip,

c. a second flap-like member formed integrally with said first flap-like member and extending beneath and in a reverse direction relative to said first flap-like member with the adjacent portion of said binding strip therebetween,

d. a lateral projection carried by at least one end of said second flap-like member and extending beyond an end of said first flap-like member adjacent thereto facilitating insertion of said second flap-like member beneath said binding strip, and

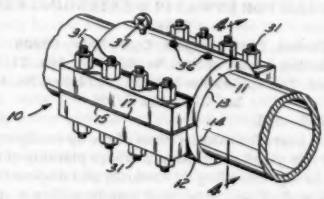
e. there being a cut-away portion in said front portion of said cover superjacent said binding strip receiving said first flap-like member upon movement of said cover into engagement with said upper side of the pad said first and second flap-like members being cut-out sections from said front portion which form said cut-away portion in said cover, and said first flap-like member being connected to the upper edge of said intermediate portion.

3,954,288

PIPE FITTING WITH SELF-TESTING SEALS AND METHOD

Joseph B. Smith, Berea, Ohio, assignor to The Pipe Line Development Co., Cleveland, Ohio

Filed Mar. 13, 1974, Ser. No. 450,868
Int. Cl.² F16L 55/16
U.S. Cl. 285—93 **15 Claims**



1. A coupling for repairing, hot tapping, or joining pipelines, comprising a sleeve having a cylindrical inner surface, a first pair of spaced gaskets circumferentially extending on said inner surface, a second pair of spaced gaskets circumferen-

tially extending on said surface and being axially spaced from said first pair, said first and second pairs of spaced gaskets respectively defining first and second axially spaced pressurizable zones when said coupling is applied to a pipe, said first and second pairs of gaskets being capable of containing pressure within said first and second zones respectively in excess of expected on-steam pressure, porting means through said coupling and into said zones, whereby when said coupling is applied to a pipeline said first and second pairs of spaced gaskets may be pressure-tested independently of on-steam line pressure by introducing a fluid through said porting means and into said zones at a pressure above expected on-stream line pressure.

3,954,289

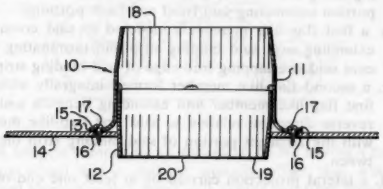
PLENUM STARTER PIECE

Lendell Martin, Sr., Houston, Tex., assignor to East Houston Air Conditioning, Inc., Houston, Tex.

Filed June 13, 1974, Ser. No. 478,918

Int. Cl.² F16L *3/04*

U.S. Cl. 285—158 **1 Claim**



1. A plenum starter piece for attaching a generally cylindrical conduit to a generally planar plenum comprising:

a relatively short generally cylindrical sheet metal starter piece body having at one end an external annular flange fitting against a planar surface of said plenum;

means fastening the flange of said body to said plenum;

the other end of said starter piece body being proportioned for telescoping engagement with a section of said conduit;

and a generally cylindrical starter piece insert of sheet metal telescoped into the flanged end of said body and secured thereto;

said insert having an end projecting axially away from said body, said projecting end extending through and engaging the peripheral edge of a generally round hole in said plenum so as to at least partially seal off around the hole and between said plenum and insert.

3,954,290

RAIN GUARD FOR UPWARDLY EXTENDING EXHAUST PIPES

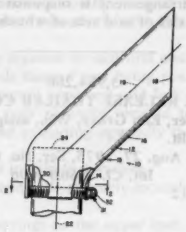
Dean L. Corbin, 1349 Prospect, Blair, Nebr. 68008

Continuation-in-part of Ser. No. 434,798, Jan. 21, 1974, abandoned. This application Mar. 11, 1974, Ser. No. 450,081

Int. Cl.² F16L *21/06*

U.S. Cl. 285—322 **4 Claims**

1. A rain guard for exhaust pipes of the upwardly extending type, said rain guard comprising: a tube, a plurality of horizontally spaced legs extending downwardly and disposed beneath the lower end of said tube, said legs bounding a space for receiving therein an end portion of an exhaust pipe, said legs being bendable for the bending of their lower ends towards the center of said space as seen in bottom plan view, and a clamp disposed around outer sides of said legs and adapted to press the lower ends of said legs horizontally inwardly towards the center of said space, the upper end of said tube having an opening at least most of which is disposed spaced horizontally



from said legs to keep vertically falling rain drops from entering said exhaust pipe, means attaching said legs to said tube.

3,954,291

REUSABLE SEALED COUPLING FOR GLASS TUBES

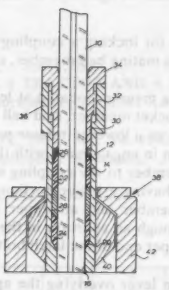
Winfried Karl Gönner, Uberlingen, Germany, assignor to Bodenseewerk Perkin-Elmer & Co. GmbH, Uberlingen, Germany

Filed Jan. 14, 1974, Ser. No. 432,805

Claims priority, application Germany, Jan. 13, 1973, 2301749; Sept. 25, 1973, 2348071

Int. Cl.² F16L *17/00*, *19/06*, *19/08*, *21/02*

U.S. Cl. 285—341 **4 Claims**



1. A connecting device for coupling glass chromatographic separating columns to chromatographic instruments comprising:

a. a metallic sleeve surrounding an end of such a column;

b. a sleeve of synthetic plastic material, possessing dimensional stability at temperatures of up to at least 350°C, coaxially interposed between said metallic sleeve and the column, said plastic and metallic sleeves having generally complementary conical end surfaces in confronting relation;

c. a sleeve-shaped thrust member coaxially disposed about said column and axially displaceable relative to said metallic sleeve;

d. a second plastic sleeve interposed between said metallic sleeve and the column and axially spaced from said first plastic sleeve, each of said sleeves having a convexly conical surface at one end and a concavely conical surface at the other, said thrust member being disposed axially between said plastic sleeves and having respective conical end surfaces complementary to the proximal ends of the plastic sleeves;

e. a second thrust member coaxially interposed between the column and said metallic sleeve and having a conical surface complementary to and in confronting relation

with the end of the plastic sleeve farthest from the column end;

f. a thrust sleeve coaxially, slidably disposed about the column and having an end portion slidably received in the metallic sleeve and abutting said second thrust member;

g. complementary threads on said metallic sleeve and thrust sleeve coacting to enable threaded axial displacement of said thrust sleeve relative to said metallic sleeve thereby generating a radial sealing force between the plastic sleeve, the column, and the metallic sleeve by abutting coation of said complementary end surfaces; and

h. connection means for detachably coupling said metallic sleeve in gas-tight relation to terminal fittings of a chromatographic instrument.

3,954,292

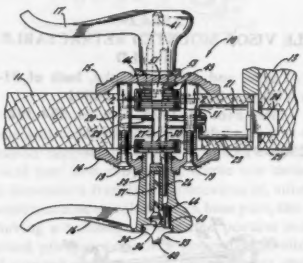
DOOR LATCH WITH TURNABLE LOCK BUTTON

Robert W. Johnson, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed June 4, 1975, Ser. No. 583,771

Int. Cl.² E05B *15/00*

U.S. Cl. 292—169.17 **8 Claims**



3. A door latch having a reciprocable latching bolt and having rotatable inside and outside operators each capable of effecting unlatching of said bolt when rotated in a first direction from a neutral position to a first unlatching position and when rotated in the opposite direction from said neutral position to a second unlatching position, a turn button supported by said inside operator to rotate between locked and unlocked positions, means associated with said button and operable to prevent rotation of said outside operator when said button is in said locked position and to free said outside operator for rotation when said button is in said unlocked position, and coacting means on said inside operator and said button for causing said button to turn automatically toward said unlocked position when said button is in said locked position and said inside operator is rotated between said neutral position and either one of said unlatching positions.

3,954,293

SELF-PROTECTING LATCH

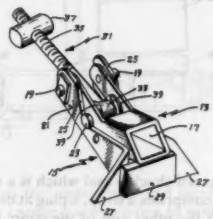
Walton A. Orr, Niceville, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 29, 1974, Ser. No. 465,221

Int. Cl.² E05C *5/00, 15/00, 19/14*

U.S. Cl. 292—256.5 **3 Claims**

1. A self-protecting latch for use on an ammunition shipping container having a cover positioned on a body portion with a resilient gasket therebetween, said latch comprising, in combination, a pivotable lever element and a channel member attached to the body portion of the container, said lever element including a socket in the forward end thereof for receiving a removable lever handle, means for pivoting said lever element relative to said channel member, a king pin positioned laterally in the central portion of said lever element, said channel member having elongated parallel side walls, said king pin extending outwardly beyond the sides of said lever arm for engaging the upper edge of the side walls of said channel member, a rod having one end pivotally attached to said lever arm and extending rearwardly therefrom, the other end of said rod being attachable to the cover of the container, and an integral pivot eye on the inward end of said rod, said pivot eye



being positioned to receive said king pin and be rotatable therearound, whereby the rotation of said pivotable lever element relative to said channel member causes said rod to be drawn inward with said pivot eye rotating on said king pin until the outward projections thereon contact the walls of said channel member thereby closing the cover and sealing the container by causing the resilient gasket to be suitably deformed.

3,954,294

PLASTIC SEALING DEVICE

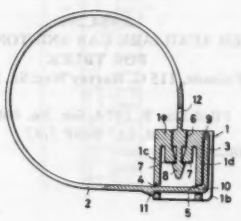
Mitsuru Iwamoto, Hachioji, and Toshie Tanaka, Machida, both of Japan, assignors to Nishiei Bussan Co., Ltd. and Nifco Inc., both of Tokyo, Japan

Filed Apr. 16, 1975, Ser. No. 569,325

Claims priority, application Japan, Apr. 26, 1974, 49-47011[U]

Int. Cl.² B65D *33/34*

U.S. Cl. 292—318 **6 Claims**

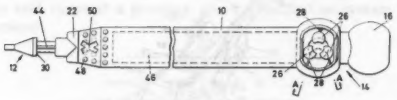


1. A plastic sealing device comprising: a hollow, bottomless cubic body having a top wall, and front and back walls and left and right side wall, said top wall having a slot, and said left and right side walls have slots along the lower edge thereof; a length of strip having a width acceptable within said slots in the side walls and including at its free end an arrowhead-shaped portion and said strip being integrally connected to said top wall at the end thereof opposite to said arrowhead-shaped end; said strip being adapted to be positioned along one side wall and thence bent to pass through said slots in a position extending between said side walls to substantially close the bottom of said body, and two resilient legs integrally connected to the inside, opposite edges of said slot of said top wall forming a throat terminating in abrupt shoulders capable of accepting and locking said arrowhead-shaped portion at the free end of said strip.

3,954,295
FASTENERS

David N. Harley, North Harrow, England, assignor to ITW Limited, Slough, England

Filed Aug. 20, 1975, Ser. No. 606,154
Claims priority, application United Kingdom, Aug. 21, 1974, 36694/74
Int. Cl.[2] B65D *27/30, 33/34*
U.S. Cl. 292—319 20 Claims

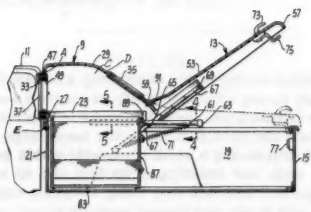


1. A tamperproof shackle seal which is a one-piece plastics moulding, and comprises a strap, a plug at one end of the strap and a socket at the other end of the strap; the plug having a leading end and a shoulder which faces away from said leading end; the socket having a sleeve-like wall which is closed at one end and has an open mouth at its other end; a number of resilient fingers fixed at first ends thereof to the wall and extending generally axially away from the mouth so that their remote ends are located in the socket; a first portion of the socket lying adjacent to the mouth, and a portion of the plug which in use co-operates with that first portion, having substantially similar non-circular internal and external outlines respectively, when viewed axially; at least a part of said internal outline of the first portion lying radially outwards of an internal outline of an immediately adjacent second portion of the socket to define thereby a further shoulder which faces the mouth; and the strap being formed with a stop which projects substantially perpendicularly therefrom; whereby insertion of the plug into the socket causes the fingers to be flexed radially outwards until they can spring back for their remote ends to abut the shoulder and hold the plug captive in the socket, insertion of a tool to occasion subsequent flexing of all the fingers being prevented by the further shoulder, and the effective length of the strap being limited to that portion lying between the stop and the plug.

3,954,296
COMBINED AUXILIARY CAB AND TONNEAU COVER FOR TRUCK

Le Roy K. Patnode, 115 G. Harvey West St., Santa Cruz, Calif. 95060

Filed May 8, 1974, Ser. No. 468,210
Int. Cl.[2] B60P *3/42*
U.S. Cl. 296—10 6 Claims

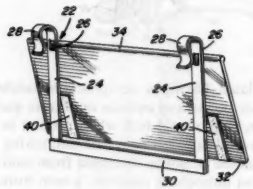


1. A combined auxiliary cab and tonneau for a conventional pickup truck having a cab and truck bed, comprising: an auxiliary cab unit having a height when placed on the bed of the pickup truck about equal to the height of the regular truck cab and forming a continuation thereof and having a length less than the length of the bed, said auxiliary cab having a front wall with an opening therethrough, opposite side walls, a downwardly and rearwardly sloping back wall, and an open bottom terminating in a peripheral bottom edge; releasable fastening means on the peripheral bottom edge for releasably fastening the combined cab and tonneau to an upper marginal edge of the bed of a pickup; a tonneau hingedly connected to the auxiliary cab and having a top wall, opposite side edge portions and front and back edge portions; hinge means connecting the front edge portion of the tonneau to the peripheral bottom edge of the back wall of the auxiliary cab, said tonneau extending from the back wall of the auxiliary cab to the back of the pickup bed when in use; lock means on the back edge portion of the tonneau cooperable with means on the back of the pickup bed to lock the tonneau in closed, covering relationship to the pickup bed; a removable seat box means releasably supported in the auxiliary cab for seating passengers, said seat box means including a back wall beneath and in substantial alignment with the back wall of the auxiliary cab and having a door means therein for gaining access thereto from the bed of the pickup; spring means connected between the tonneau and the auxiliary cab to counterbalance the tonneau; and seat box retaining means on the front edge portion of the tonneau, engaging the seat box to aid in securing it in position when the tonneau is closed.

3,954,297
VEHICLE VISOR MOUNTED RETRACTABLE GLARE SHIELD

Wilbur F. Linke, and Alice L. Linke, both of 31-4th Place, Victory Village, Mankato, Minn. 56001

Filed Feb. 28, 1975, Ser. No. 554,392
Int. Cl.[2] B60J *3/02*
U.S. Cl. 296—97 C 7 Claims



1. In combination, a pair of generally parallel support arms, elongated brace means extending between and interconnecting one pair of corresponding ends of said support arms, the other pair of corresponding end portions of said arms including clamp means for removably clampingly engaging the free swingable longitudinal edge portion of an elongated vehicle sun visor in selected position therealong with said support arms supported from said visor and underlying and extending transversely of the undersurface thereof toward the other longitudinal edge portion thereof when the visor is in a raised generally horizontal position, a generally planar transparent and light-filtering panel having one generally straight marginal edge portion and a second edge portion opposite said one marginal edge portion, said other pair of end portions of said support arms and said one marginal edge portion of said panel including coacting mounting means pivotally supporting said one marginal portion from said support arms for oscillation of said panel relative to said other pair of end portions of said support arms, said one pair of end portions of said support arms and predetermined portions of said second edge portion including coacting magnetically attractable means, said panel being swingable relative to said support arms to a position closely paralleling the latter with said coacting magnetically attractable means at least in close juxtaposition and said second edge portion of said panel magnetically biased against swinging away from said one pair of end portions of said arms.

3,954,298

HEIGHT ADJUSTMENT MECHANISM FOR SUSPENSION SEAT

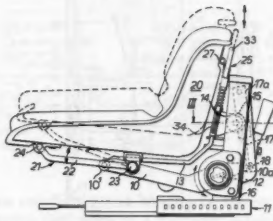
Frederick G. Lowe, Pitsford, England, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 21, 1974, Ser. No. 471,945

Claims priority, application United Kingdom, May 22, 1973, 24450/73

Int. Cl.² B60N 1/02; A47C 3/20

U.S. Cl. 297—308 6 Claims



1. A vehicle seat comprising an L-shaped seat part mounted on an L-shaped supporting frame, a spring suspension on which the seat part and supporting frame are mounted for upward and downward translational movement, substantially without pivotal movement, relative to a base part, the supporting frame having a horizontally-directed portion and an upwardly-directed portion extending generally parallel to the direction of upward movement of the seat part and height-varying coupling means between the seat part and the supporting frame which permits the seat part to be raised or lowered and locked at a selected height relative to the supporting frame, the height-varying coupling means comprising a slide coupling located between upper portions of the seat part and supporting frame and movable in the plane of the upwardly-directed portion of the supporting frame and means for locking the slide coupling at a selected position of the seat part relative to the supporting frame, and a coupling arm pivotally connected at one end thereof to a forward portion of the seat part and at its opposite end to a pivot member which moves upwards and downwards with the supporting frame and spring suspension as said supporting frame is moved upwards and downwards by said spring suspension.

3,954,299

LONGWALL MINING MACHINE WITH PIVOTAL BODY ADJUSTMENT

Dennis Hartley, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

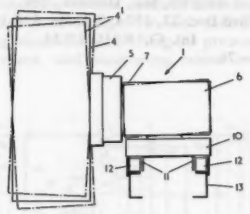
Filed Feb. 10, 1975, Ser. No. 548,785

Claims priority, application United Kingdom, Apr. 5, 1974, 15246/74

Int. Cl.² E21C 35/06

U.S. Cl. 299—1 9 Claims

1. A mining machine which in use traverses back and forth along a face conveyor extending along a working face, said machine comprising a supporting underframe movably engaging the conveyor, a body assembly supported by the supporting underframe and at least a portion of which is pivotally mounted relatively to the supporting underframe for pivotal movement about an axis extending generally in the direction of machine traverse, at least one cutter carrying arm pivotally mounted on said portion of the body assembly for movement about a second axis transverse to the direction of machine traverse, first means for pivoting said portion of the body



assembly relative to the underframe and second means for pivoting the cutter carrying arm relative to said portion.

3,954,300

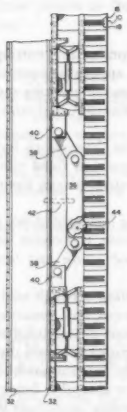
MINING MACHINE LONGWALL PROPULSION MEANS

Robert W. Johns, Calgary, Canada, assignor to World Oil Mining Ltd., Calgary, Canada

Filed Feb. 13, 1975, Ser. No. 549,823

Int. Cl.² E21C 29/02

U.S. Cl. 299—42 12 Claims



1. A longwall propulsion means for the mining machine in a fixed arch shield mining apparatus wherein the mining machine is movably supported by the shield, the shield including a plurality of individually advanceable arch sections having a horizontal base portion and an upstanding portion in side-by-side relationship so that said upstanding portions collectively form a rack, said propulsion means comprising:

a. power transfer means secured to the mining machine,

b. said power transfer means being shiftable from a non-driving position to a driving position,

c. said power transfer means including a drive member engageable with said rack when said power transfer means is in said driving position,

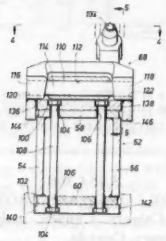
d. means for actuating said drive member so that said drive member engages said rack and thereby advances the mining machine relative to said shield.

3,954,301

CHAIN LINK CONVEYOR APPARATUS FOR CUTTING HARD EARTH FORMATIONS

Clarence L. Stepp, Houston, Tex., assignor to Boring & Tunneling Co. of America, Inc., Houston, Tex.

Filed Dec. 23, 1974, Ser. No. 535,174
Int. Cl.[2] E21C *25/24*
U.S. Cl. 299—76 5 Claims



1. Apparatus for conducting cutting operations in hard earth formations, said apparatus comprising:

a conveyor support member being movably connected to a prime mover mechanism, said conveyor support member including

a hollow cutter bar framework having top, bottom and side pieces disposed in fixed relation one to the other, said top and bottom pieces having a plurality of apertures,

wear plates being assembled to said top and bottom pieces and having transverse edges formed thereon defining opposed guide and lateral force restraining surfaces;

bolt means extending through said apertures of said top and bottom pieces and securing said wear plates in assembly with said cutter bar framework;

rotary conveyor sprocket means disposed at each extremity of said cutter bar framework;

a chain link conveyor assembly being received by said conveyor support member, said chain link conveyor assembly including

a plurality of interconnected links adapted for mating engaging relation with said conveyor sprocket means;

earth cutting means supported by each of said links and disposed for cutting engagement with the earth formation;

means for imparting rotary movement to said sprocket means to cause rotary movement of said interconnected links; and

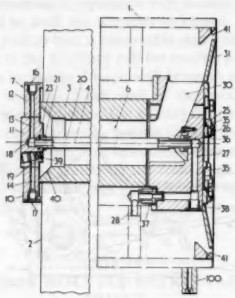
a pair of spaced lateral thrust load transmitting flanges extending from each of said links and being disposed for guiding contacting relation with said opposed guide and lateral force restraining surfaces, said flanges engaging said guide and lateral force restraining surfaces responsive to application of lateral thrust forces thereto, transmitting said lateral thrust loads directly into said conveyor support member and preventing lateral overstressing of the connections between the links of said chain link conveyor assembly by said lateral thrust forces.

3,954,302

APPARATUS FOR VENTILATING CUTTER HEADS OF MINERAL MINING MACHINES

Eric John Browning, Lichfield, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Dec. 27, 1974, Ser. No. 536,739
Claims priority, application United Kingdom, Jan. 18, 1974, 02430/74
Int. Cl.[2] E21C *25/10*
U.S. Cl. 299—81 8 Claims



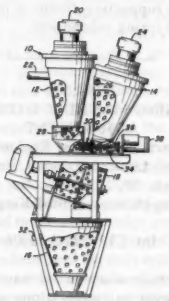
1. Apparatus for ventilating a mining machine cutter head of the kind adapted to be drivably mounted on a hollow or axially bored driven shaft and provided with at least one outlet spray for dust suppression fluid, comprising a component for attachment to the machine adjacent to the end of the driven shaft remote from the cutter head, the component defining inlet means for dust suppression fluid, a straight hollow elongated member for extending said inlet means for dust suppression fluid along the axis of the driven shaft to a plurality of sprays in the cutter head, and outlet nozzle means radially spaced from the axis of the bore for directing at least one air flow-inducing jet of fluid along the bore of the driven shaft.

3,954,303

VACUUM LOADER SYSTEM

Douglas James Boring, Franklin, Pa., assignor to Conair, Inc., Franklin, Pa.

Filed Dec. 23, 1974, Ser. No. 535,228
Int. Cl.[2] B65G *53/40*
U.S. Cl. 302—62 13 Claims



1. A vacuum hopper assembly comprising: a material receiving hopper member having a material entrance section and a material discharge means; suction means operable to draw material through said entrance section and into said hopper member and initiate a flow of ambient air through said discharge means into said hopper member, and said discharge

means having a deformable portion deformable in response to said initial flow of ambient air to engage a non-deformable portion thereof to provide an ambient air seal therebetween.

3,954,304

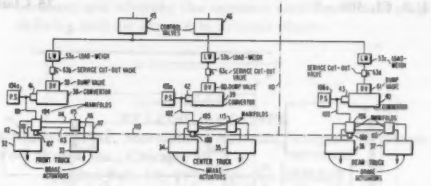
EMERGENCY AND HANDBRAKE CONTROL SYSTEM

Thomas Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed June 17, 1974, Ser. No. 480,440

Int. Cl.² B60T *13/00*

U.S. Cl. 303—13 **10 Claims**



7. In an emergency and handbrake system for use with a friction brake that employs a hydraulic actuator for the friction brake and a spring actuator for the emergency and handbrake, the improvement which comprises;

a. a first hydraulic motor for actuating said friction brake, and a second hydraulic motor for restraining said spring actuator,

b. manifold means for communicating hydraulic fluid under pressure to said first and second fluid motors, said manifold means defining a during supply line to said first fluid motor and a second supply line to said second fluid motor,

c. means connected between said first and second supply lines for alternatively closing communication between said first and second supply lines furing normal operation; or permitting pressure equalization between said first and second supply lines in response to an emergency or handbrake control signal irrespective of the pressure existing in said first hydraulic motor, thereby equalizing the pressures in said hydraulic motors and preventing overapplication of said friction brake due to an emergency or handbrake application during a service brake application;

d. means for establishing one-way communication from said first supply line to said second supply line thereby permitting transfer of hydraulic fluid under pressure from said first supply line to said second supply line when the pressure in the former exceeds in the pressure in the latter, and

e. control means for opening said means for alternatively closing communication or permitting pressure equalization.

3,954,305

ACTUATOR ASSEMBLIES FOR VEHICLE BRAKES

Brian Ingram, Balsall Common, and David Anthony Harries, Shirley, both of England, assignors to Girling Limited, Birmingham, England

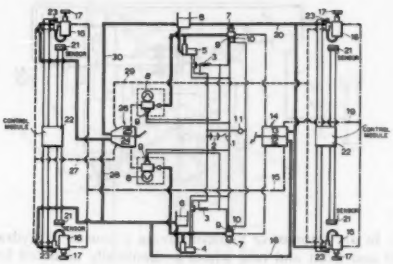
Filed Sept. 10, 1973, Ser. No. 395,557

Claims priority, application United Kingdom, Sept. 26, 1972, 44311/72; May 23, 1973, 24732/73

Int. Cl.² B60T *8/06*

U.S. Cl. 303—21 F **19 Claims**

1. An actuator assembly for a vehicle brake comprising a housing provided with an inlet for connection to a supply of hydraulic fluid under pressure, first and second actuating members working in said housing, said first actuating member being adapted to apply a mechanical force to said brake and being bounded by a pressure space communicating with said inlet whereby said mechanical force is responsive to changes in hydraulic pressure in said pressure space, resilient means biassing said second actuating member to engage said first actuating member to apply an actuating force to said brake, means for subjecting said second actuating member to fluid pressure in opposition to said resilient means to hold said second member out of engagement with said first member, and modulating means for modulating the pressure of fluid in said pressure space, said modulating means comprising an



inlet valve controlling communication between said inlet and said pressure space, a modulator piston assembly movable in said housing between a first position in which said inlet valve is open and a second position in which said inlet valve is closed, means for subjecting said modulator piston assembly to fluid pressure to urge it into the first position, and means for subjecting said modulator piston to fluid pressure to urge it into the second position.

3,954,306

LOAD RESPONSIVE BRAKE PRESSURE CONTROL VALVES

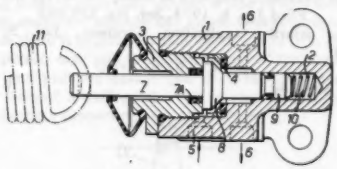
Wolfgang Hess, Ruebenach, Germany, assignor to Girling Limited, Birmingham, England

Filed June 26, 1974, Ser. No. 483,414

Claims priority, application United Kingdom, June 26, 1973, 30332/73

Int. Cl.² B60T *8/18*

U.S. Cl. 303—22 R **7 Claims**

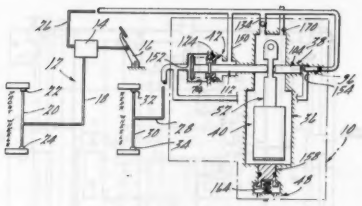


1. An hydraulic brake pressure control valve, comprising a housing having an inlet adapted to be connected to a source of pressure and an outlet, a movable valve member for controlling communication between said inlet and said outlet and a tension spring having one end connected directly to said valve member and having a second end adapted for direct connection to a vehicle part movable relative to another vehicle part on which said valve is mounted in use to vary the tension in said spring according to the loading of the vehicle said movable valve member being part of a differential piston member which is adapted to be urged in a valve closing direction by hydraulic pressure upon pressurization of the valve inlet, said tension spring applying to said valve member a force tending to hold said valve open.

3,954,307
LOAD SENSING PROPORTIONING VALVE INCLUDING INERTIA RESPONSIVE ELEMENT

Michael R. Young, Farmington, Mich., assignor to Kelsey-Hayes Corporation, Detroit, Mich.

Filed Jan. 21, 1974, Ser. No. 434,954
Int. Cl.² B60T 8/16
U.S. Cl. 303—24 F 54 Claims



1. In an automotive vehicle having a source of hydraulic fluid and front and rear wheel hydraulically actuated brake systems, the improvement comprising:

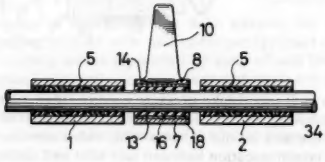
proportioning valve means in one of the systems actuable for modulating the brake pressure in that one system to provide for a reduced brake effect at the rear wheels relative to that at the front wheels to compensate for weight transfer during braking,

said proportioning valve means comprising a modulating piston means movable between positions opening and closing a flow path from said fluid source to said one brake system, and bias means providing a force to move said piston means toward one of said positions, said bias means including a first means responsive to the magnitude of deceleration of the vehicle and second means responsive to fluid pressure from said fluid source and the modulated fluid pressure from said proportioning valve means, whereby the modulating effect of said proportioning valve means compensates for variations in loading of the vehicle.

3,954,308
DIVISIBLE CONNECTOR FOR TRACK LAYING CHAINS OF TRACK LAYING VEHICLES

Otto Korner, Wermelskirchen, and Klaus Spies, Remscheid, both of Germany, assignors to Diehl, Nurnberg, Germany

Filed Jan. 6, 1975, Ser. No. 539,003
Claims priority, application Germany, Jan. 5, 1974, 2400481
Int. Cl.² B62D 55/20
U.S. Cl. 305—40 9 Claims

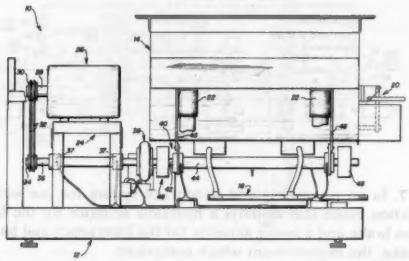


1. In combination: two successive bolts of a track laying chain arranged parallel to and one behind the other in transversely spaced relationship to each other, two sleeves of elastomeric material respective vulcanized onto said bolts as an elastic intermediate insert layer over the entire range thereof to equalize load distribution transmitted uniformly thereby so as to reduce localized scouring coining and danger of breakage and in alignment with each other in a direction transverse to the axial direction of said bolts, tubular bodies respectively journalled elastically as mounted directly on said sleeves, and connecting means interconnecting said elastically journalled tubular bodies.

3,954,309
HYDRODYNAMIC BEARINGS FOR VIBRATORY MECHANISMS

Richard Neil Hutson, Dallas; Kenneth J. Fewel, Arlington, and William P. Goode, Dallas, all of Tex., assignors to The Hutson Corporation, Arlington, Tex.

Filed Nov. 21, 1974, Ser. No. 525,872
Int. Cl.² F16C 33/72
U.S. Cl. 308—9 35 Claims



1. A mechanism comprising:

apparatus responsive to vibratory actuation for preforming a predetermined function;

eccentric means including a shaft;

means for rotating the shaft and thereby actuating the eccentric means to generate vibration;

a housing connected to the apparatus;

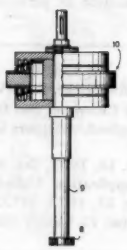
hydrodynamic bearing means mounted in the housing and rotatably supporting the shaft of the eccentric means whereby vibration is transmitted from the eccentric means through the hydrodynamic bearing means and the housing to the apparatus;

said housing and said shaft having matched deflection characteristics under the action of the eccentric means.

3,954,310
RADIAL MAGNETIC BEARING

Edoardo Rava, Savonera, Turin, Italy

Filed Jan. 12, 1972, Ser. No. 217,208
Claims priority, application Italy, Sept. 30, 1971, 70202/71
Int. Cl.² F16C 39/06
U.S. Cl. 308—10 1 Claim



1. A magnetic bearing comprising:

a. a fixed, annular magnet having opposed ends substantially transverse the longitudinal axis thereof;

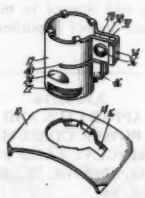
b. a plurality of axially extending, concentric rings integral with said ends of said magnet;

c. a rotatable shaft coaxial with said magnets;
d. a pair of axially spaced apart end caps integral with said shaft, each said end cap being in opposition to one end of said magnet for defining the housing thereof; and
e. a plurality of axially extending, concentric rings integral with each said end cap, said rings of each said end cap being aligned with said rings of said magnet that are in opposition thereto, said rings of said end cap being axially spaced from said rings of said magnet for defining an air gap therebetween, said rings of said magnet having different axial lengths and said rings of said end caps having correspondingly different axial lengths whereby the axial dimension of said air gap therebetween is substantially constant and whereby the opposed surfaces of said rings defining said air gap are in arcuate planes.

3,954,311
BEARING RETAINER

Ian Maxwell Pike, Mordialloc, Australia, assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 10, 1975, Ser. No. 548,705
Claims priority, application Australia, Feb. 12, 1974, 6561/74
Int. Cl.² F16C *35/08*
U.S. Cl. 308—25 **6 Claims**

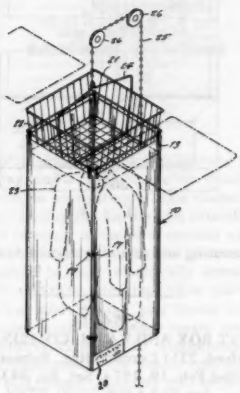


1. A bearing retainer comprising a base having a hole therein to receive a generally cylindrical housing, said housing having a plurality of upper lugs extending outwardly and downwardly therefrom, a plurality of lower lugs extending outwardly and upwardly therefrom, a plurality of inwardly directed projections in said housing, the parts being so arranged that, in use, said plurality of upper lugs act upon said base and said plurality of lower lugs act upon a panel so as to retain said base, said housing and said panel in assembled relation, said housing being further provided with a vertical split extending for the entire height thereof, a first pair of outwardly extending arms extending from said housing on either side of said split, said housing including at least one outwardly extending second arm, said at least one second arm extending from said housing adjacent said split; said at least one second arm being separated from said first pair of arms by a horizontally extending slit in said housing and being adapted to, in use, be received in an extension portion of said hole so as to prevent rotational movement of the housing relative to said base, said base having a generally rectangular configuration and being resiliently curved in at least the longitudinal direction thereof, said base including down-turned feet at each corner thereof and a plurality of down-turned flanges around said hole so as to, in use, bear upon said housing between said plurality of upper lugs and said plurality of lower lugs.

3,954,312
WRAP-AROUND SKIRT FOR LOCKER BASKETS

William Westley Hand, 324 State Rte. 7 Lot A, Powhatan Point, Ohio 43942

Filed June 12, 1974, Ser. No. 478,458
Int. Cl.² A47B *81/00*
U.S. Cl. 312—213 **2 Claims**



1. In a wrap-around skirt and locker basket assembly for clothing to be surrounded by other clothing, the combination of a clothes locker basket and a wrap-around skirt depending therefrom, said skirt comprised of a rectangular material being of a length that is equal to a perimeter around a rectangular bottom wall of said locker Basket, said sheeting material being supported at four corners of said locker basket, said sheeting material accordingly forming a rectangular enclosure enclosing clothing suspended below said locker basket so that said clothing does not come into physical contact with other clothing located externally around a side of said rectangular sheeting enclosure wherein the locker basket includes a bail to which there is secured a chain which passes over pulleys so that a person may pull the opposite end of the chain downwardly and pull the basket and the wrap-around skirt upwardly toward a ceiling where it is surrounded by similar locker baskets supporting said other clothing.

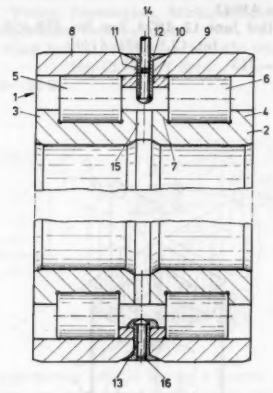
3,954,313
ANTI-FRICTION ROLL BEARINGS

Karl-Heinz Haenel, Niederwerrn, Germany, assignor to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands

Filed Sept. 30, 1974, Ser. No. 510,295
Claims priority, application Germany, Oct. 4, 1973, 2349942
Int. Cl.² F16C *33/58*
U.S. Cl. 308—216 **5 Claims**

1. An anti-friction bearing comprising an inner and outer race ring and a plurality of rolling bodies arranged therebetween, a separate retaining edge member adapted to engage the surface of one of said race rings adjacent said rolling bodies, said retaining edge member and said engag race ring being formed with correspondingly arranged radial holes

formed about their circumference and rivets extending through at least some of said holes said rivets having a head



at each end securing said retaining edge and engaged race ring together.

3,954,314

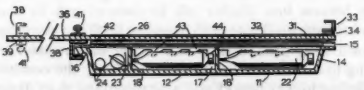
PAINT BOX AND EASEL COMBINATION

Donald Crawford, 2211 Coronet Blvd., Belmont, Calif. 94002

Filed Feb. 19, 1974, Ser. No. 443,370

Int. Cl.² A47B *27/00, 97/04*

U.S. Cl. 312—231 **6 Claims**



1. A paint box easel combination, comprising an open top tray formed with dividers into a plurality of compartments for paints, brushes and the like, a palette lid dimensioned substantially as large as said tray and shaped to form a cover for said tray when positioned on top of said tray, said dividers elevated to close proximity to said palette lid when said lid is on top of said tray, said palette lid being totally removable from said tray and also being capable of being placed on top of said tray, a socket forming member having a width substantially less than the width of said tray, means hingedly connecting said member to one edge of said tray, an easel upright extension bar fitting in said member, and latch means on said bar cooperating with said tray to fit over the outside of said palette lid when said palette lid is placed on top of said tray to hold said palette lid in close contact with said tray and completely covering said tray, whereby said palette lid comprises the sole cover for said tray.

3,954,315

CABINET DRAWER

Edwin H. Sanden, Box 215, Morrison, Colo. 80405

Filed Feb. 26, 1975, Ser. No. 553,173

Int. Cl.² A47B *88/00*

U.S. Cl. 312—333 **3 Claims**

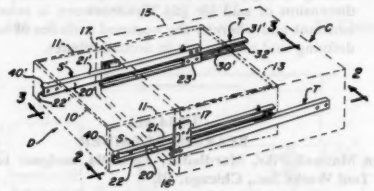
1. A device for opening a drawer having side walls and disposed in a cabinet having upright side walls and an upright front wall, comprising:

an inwardly facing channel track mounted on each side wall of said cabinet to slope downwardly from rear to front, said tracks being mounted at corresponding vertical positions;

an outwardly facing channel slide mounted on each side wall of said drawer in a position parallel to the corresponding track and sloping downwardly from rear to front at a corresponding angle;

each said track including mounting means for a roller adjacent the front of said track and engaged by an upper flange of the corresponding slide;

each said upper flange of each slide having an arcuate, upwardly extending indentation engaged by said roller with said drawer closed, said indentation corresponding



in shape to the periphery of said roller and adapted to engage said slide roller to maintain said drawer in closed position against gravity; and

the front edge of said indentation having a sufficient extent to permit said drawer to be pushed inwardly from closed position to cause the front of said indentation to rock up onto said roller and cause said slide and drawer to be moved upwardly and then move downwardly on release, thereby causing said drawer to move to a fully open position after said drawer is pushed rearwardly and released.

3,954,316

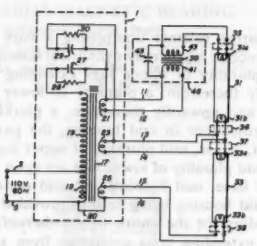
ELECTRICAL APPARATUS AND METHOD FOR REDUCING POWER CONSUMPTION OF A FLUORESCENT LAMP SYSTEM

Julius Frank Luchetta, Elmhurst, Ill., assignor to Litton Systems, Inc., Bellwood, Ill.

Filed Jan. 8, 1975, Ser. No. 539,355

Int. Cl.² H05B *41/14*

U.S. Cl. 315—96 **7 Claims**



1. In combination, an attachment for reducing illumination and power consumption in a rapid-start type fluorescent lamp lighting system of the type having an encased relatively inaccessible ballast transformer and capacitor combination with a pair of electrical leads extending therefrom connected within the case to a low voltage filament secondary winding on said encased transformer and a pair of series connected fluorescent lamps each of which has a lamp filament winding at each end, and in which said capacitor is connected inside the casing in circuit betwen an end of the high voltage secondary windings of said transformer and one of said leads, comprising in combination with said ballast and lamps:

an isolation transformer, said transformer having a primary winding, a secondary winding, each of said primary windings comprising a first and second predetermined number of turns of electrically insulated wire, respectively, and said windings being DC isolated from one another;

an electrical capacitor, said capacitor having first and second leads and said first lead connected to said secondary winding of said isolation transformer and said second lead connected in circuit to said primary winding of said isolation transformer for decreasing the electrical capacitance in series circuit with said lamp;

means for connecting said secondary winding of said isolation transformer in circuit with a one of the lamp filament windings at the end of said series connected lamps for supplying low AC voltage from said secondary to said filament windings; and means for connecting said primary winding of said isolation transformer in circuit with the leads to said filament secondary winding of said ballast transformer for supplying low AC voltage to said primary.

3,954,317

ELASTOMERIC CONNECTOR AND ITS METHOD OF MANUFACTURE

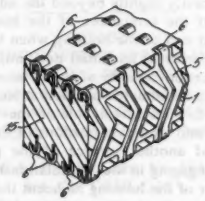
Hermanus Petrus Johannes Gilissen, Esch, and Petrus Richardus Martinus van Dijk, 's-Hertogenbosch, both of Netherlands, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 11, 1975, Ser. No. 549,108

Claims priority, application Netherlands, Feb. 27, 1974, 7402641

Int. Cl.² H05K 1/12

U.S. Cl. 339—17 E **2 Claims**



1. A matrix connector comprising an elastomer body presenting a pair of opposite contact surfaces at each of which is disposed a multiplicity of spaced contacts, the contacts of the opposite faces being interconnected by conductors extending through the body and being defined by folds of flat metal strips extending through the elastomeric mass to interconnect the contacts at the opposite surfaces, in which individual rows of contacts and their associated conductors are formed as circuits on respective lamina flexible printed circuits of strip-like form, each strip-like printed circuit lamina having the circuits on one side only of the strip and extending substantially between side edges of the strip, side edge portions of the strip being folded over onto the side devoid of the circuits and the conductors extending externally around the folded side-edge portions, a plurality of such strip-like printed circuits, being disposed in generally parallel spaced relationship within the body of elastomeric material, the folded conductor portions being exposed at opposite faces of the elastomer body to define the spaced contacts.

3,954,318

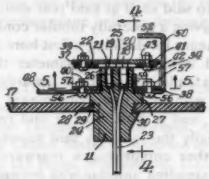
ELECTRICAL CONNECTOR

Donald Herbert Larson, Arlington Heights, and Joseph E. Josephs, Chicago, both of Ill., assignors to Warwick Electronics Inc., Chicago, Ill.

Filed Jan. 30, 1975, Ser. No. 545,618

Int. Cl.² H01R 13/62

U.S. Cl. 339—64 R **16 Claims**



1. In an electrical appliance having a housing provided with an access opening, and a closure panel for closing said opening, the improvement comprising: a male electrical connector mounted in said housing and having pins extending outwardly to adjacent said opening; a female connector carried by said panel to have limited lateral movement relative to said panel and being disposed to have electrically connected mating engagement with said male connector when said closure panel is disposed to close said opening, said female connector having outer insulating means; and guide means mounted in said housing in accurately aligned fixed relationship to said male connector for engagement by the female connector insulating means to guide said female connector into accurate alignment with said male connector prior to engagement of said pins by said female connector.

3,954,319

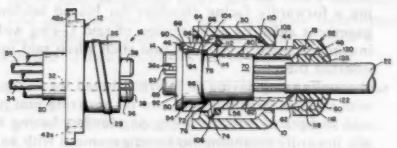
ENVIRONMENT PROOF ELECTRICAL CONNECTOR ASSEMBLY

Warren L. Haines, Santa Ana, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 20, 1974, Ser. No. 471,615

Int. Cl.² H01R 7/02

U.S. Cl. 339—94 M **13 Claims**



1. An electrical connector assembly comprising:

a plug of generally circular cross-section having an even number of electrical contacts therein with insulated wires secured to said contacts, and a receptacle of generally circular cross-section having the same even number of electrical contacts therein with insulated wires secured to said plug electrical contacts for electrical engagement with said plug electrical contacts;

said receptacle having an external thread thereon and means for defining the same even number of bores spaced equally from each other and about the axis of said receptacle and extending therethrough from a front end to a rear end for reception of said receptacle electrical contacts, said receptacle further having one-half the same number of keying protrusion sections as there are contacts, said keying protrusion sections being of generally triangular cross-section at said front end with means for defining circumferentially spaced recesses between said sections, one of said sections being of larger circum-

ferential size than the remaining sections, each of said keying sections being bounded by two generally radially extending side walls with each of said bore means extending along and partially within each of said walls;

said plug comprising a shell having a forward end and a rear end, an insert positioned within said forward end of said shell in keyed angular orientation therewith, an O-ring between said insert and said shell, a coupling ring rotatably journalled about said shell, and wire sealing means secured to said shell at said rear end,

said shell having a generally tubular configuration and comprising means for defining a first bore at said forward end, a second bore of lesser diameter than said first bore means extending therefrom towards said rear end for defining with said first bore means a forwardly facing shoulder, and a third bore at said rear end of diameter substantially the same as said second bore means, said shell further comprising a rearwardly and radially inwardly extending annular wall between said second and third bore means and a radially inwardly canted tongue at said forward end extending into said first bore means and towards said rear end,

said insert having a front end and rear end and comprising a generally cylindrical body having a first section of diameter substantially equal to that of said shell first bore means for insertion therein, a second section of diameter substantially equal to that of said shell second bore means for insertion therein and terminating at said insert rear end for defining with said first section a rearwardly facing shoulder for sealing said O-ring against said shell forwardly facing shoulder, one-half the same number of keying protrusion sections as there are contacts, said keying sections being at said insert front end with means for defining circumferentially spaced recesses between said keying sections and configured identically as said receptacle shell keying sections and recess means whereby said insert and said receptacle are mateable in only one preselected angular orientation, said insert further including means for defining the same even number of bores spaced equally from each other and about the axis of said insert and extending therethrough from said front end to said rear end and along and partially within the side walls of said insert keying sections for reception and protection of said plug electrical contacts, said insert first section having a flat formed therein extending partly towards said insert rearwardly facing shoulder for defining a forwardly facing shoulder for biased latching engagement aided by compression of said O-ring with said inwardly canted tongue on said shell when said insert is inserted therein,

said coupling ring having an internal thread for engagement with said receptacle thread and for securing said plug to said receptacle, said coupling ring further having a radially inwardly extending lip for engagement with an abutment on said plug shell for limiting movement of said coupling ring towards said shell forward end for enabling said plug to receptacle securement, and

said wire sealing means comprising an elastomeric annular seal bounded by inwardly bevelled side surfaces and seated within said plug shell third bore means and against said plug inwardly extending annular wall, a compression ring bounded by outwardly bevelled side surfaces having radially spaced protuberances thereon and seated within said plug shell third bore means and against said annular seal, and a gland nut threadedly engaged with said plug shell and including an end cap having means therein for defining an opening for said insulated wires extending from said plug contacts, through said annular seal and said compression ring, said gland nut having indentations spaced about said opening means for mating and latching engagement with said spaced protuberances on one of said compression ring bevelled surfaces and, when said gland nut is threaded onto said plug shell, for pressing said gland nut end cap against said compression ring and said annular seal and thereby for compressing said annular seal against said insulated wires and for latching against said compression ring for inhibiting reverse threading between said gland nut and said plug shell.

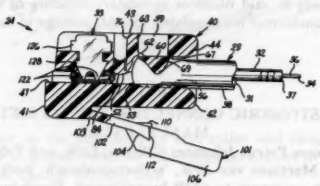
3,954,320
ELECTRICAL CONNECTING DEVICES FOR TERMINATING CORDS

Edwin Charles Hardesty, Perry Hall, Md., assignor to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 377,154, July 6, 1973, Pat. No. 3,860,316. This application Nov. 6, 1974, Ser. No. 521,429

Int. Cl.² H01R *11/20*

U.S. Cl. 339—99 R **8 Claims**



8. A device for terminating a cord, which comprises:

an unipartite dielectric housing having one free end with internal surfaces of the housing defining a cavity that opens to the other end of the housing for receiving and substantially enclosing an end portion of a cord, with at least one portion of the housing adjacent the cavity connected pivotally to the remainder of the housing toward the free end thereof and having a surface which protrudes into the cavity slightly beyond the adjacent surface of a portion of the remiander of the housing adjacent the cord-input end of the housing when the pivotally moveable portion is in an initial position, the pivotally connected portion capable of being moved from the initial position to an actuated position at least partially into the cavity with substantially all of the protruding surface engaging and clamping portions of the cord, and with a portion of another surface of the pivotally moveable portion engaging in locking relationship a portion of the remainder of the housing adjacent the cord-input end of the housing, the locking relationship being maintained during the application of retrograde forces to the cord.

3,954,321
MINIATURE ELECTRICAL CONNECTOR

Robert F. Casper, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

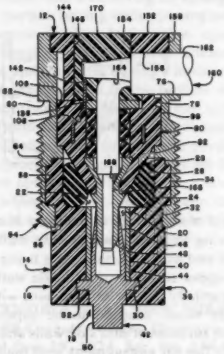
Filed Aug. 13, 1975, Ser. No. 604,386

Int. Cl.² H01R *17/18*

U.S. Cl. 339—177 R **10 Claims**

1. A miniature coaxial cable electrical connector comprising a plug member and a receptacle member; said receptacle member comprising an electrically insulative bushing having an opening therethrough with an annular recess at one end, a compressible sealing ring within said recess for mating with said plug member, a metal sleeve encircling a portion of said bushing and forming a cavity to house said plug member and having an inwardly projecting locking flange and an adjacent exteriorly exposed releasing aperture at an end opposite said bushing, a receptacle contact element in said opening and projecting from the end opposite said recess for facilitating electrical connection therewith and having a slotted socket portion for resiliently gripping a pin contact element; a plug

member comprising an electrically insulating bushing having a front portion opening and a rear portion opening and a conically tapered outer surface cooperating with said ring to provide an elongated electrical current leakage path, a hollow pin contact element partially within said front portion opening, means including a radially movable finger for cooperating with said locking flange to interlock said plug member and receptacle member and maintain said elongated electrical



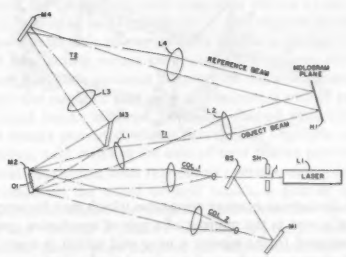
current leakage path, a plurality of sealing rings and retaining washer within said opening into the plug bushing for sealing engagement with a coaxial cable, means carried by said bushing for providing electrical ground connection with a said cable, said metal sleeve having a keyway at an inner wall thereof and said plug bushing having a complementary projecting key on an outer surface thereof, cooperating with said keyway to prevent rotation of said plug member relative to said receptacle member.

3,954,322

HOLOGRAPHIC DOPPLER-SPREAD IMAGING OF MOVING OBJECTS

Carl C. Aleksoff, Ann Arbor, Mich., and Charles R. Christensen, Athens, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 28, 1975, Ser. No. 554,340
Int. Cl.² G03H 1/14
U.S. Cl. 350—3.5 **1 Claim**



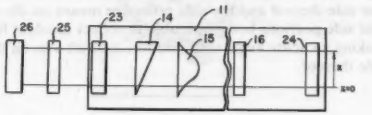
1. A holographic Doppler-spread imaging system comprising: a laser for producing a coherent single frequency light beam; a rotating reflecting object which is to be recorded; a plane mirror reflecting means; said mirror reflecting means and said object being attached to each other so that their movements are synchronized; beam-splitting means for directing a portion of said light beam onto said object along a first path and for directing another portion of said light beam onto said mirror reflecting means along a second different path; a first telescope receiving reflected light from said object for imaging said object onto a recording plane; a second telescope receiving reflected light from the reflecting means for imaging said reflecting means onto said recording plane; film means located in said recording plane for recording a hologram of said object; and shutter means located between said laser and beamsplitting means for limiting exposure of said film means so that a holographic recording of the object will occur while the object is rotating and timed to have the reflecting means parallel to the recording plane halfway through the exposure.

3,954,323

OPTICAL WAVEGUIDE LINEAR MODULATOR ARRAY

Ronald A. Andrews, Alexandria, Va.; A. Fenner Milton, Washington, D.C., and Thomas G. Giallorenzi, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 23, 1973, Ser. No. 344,404
Int. Cl.² G02B 5/14; G02F 1/05
U.S. Cl. 350—96 WG **4 Claims**



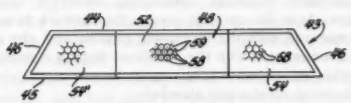
1. An optical waveguide modulator array; which comprises,
a rectangular waveguide layer,
a rectangular substrate supporting said waveguide layer,
said substrate having an index of refraction less than that of said waveguide layer,
a medium on the opposite side of said waveguide layer from said substrate,
said medium having an index of refraction less than that of said waveguide layer,
a plurality of pairs of electrodes secured relative to said waveguide layer electrically insulated therefrom and with each pair operative to modulate the phase of radiation passing through said waveguide layer whose length is a function of position across the optical beam,
one electrode of each pair of electrodes secured on and above said waveguide layer and the other electrode of said pairs secured below said waveguide layer opposite said upper electrode within said substrate, and
each pair of said electrodes are of different shape.

3,954,324

PAVEMENT MARKER HAVING CONICAL RETRO-REFLECTORS

Robin A. Arnott, and John F. Domaracki, both of Windsor, Canada, assignors to International Tools (1973) Limited, Windsor, Canada

Filed Oct. 22, 1974, Ser. No. 516,930
Int. Cl.² G02B 5/136
U.S. Cl. 350—109 **15 Claims**



1. A pavement marker comprising: a housing having a base for engagement with the surface of a roadway and a reflective wall for reflecting light from vehicles on the roadway; said reflective wall having a central portion extending transversely of the fore-and-aft axis of the housing for reflecting incident

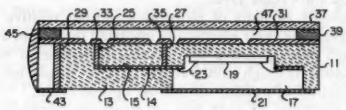
light rays generally parallel to said fore-and-aft axis, and a pair of side portions extending from opposite ends of said central portion; said central portion having an outer surface extending at an acute angle with respect to said base; said central portion having an inner surface formed with a plurality of central reflector elements, said central reflector elements each being of conical configuration and having an apex located remotely from said outer surface with a side wall of circular cross-section extending continuously from said apex to the inner surface of said central portion, the axis of each cone passing through the apex thereof lying in a plane that is perpendicular to the plane of said base and is parallel to the fore-and-aft axis of said housing, and the axis of each cone extending at an acute angle with respect to the normal to said outer face such that incident light rays on said outer face that are generally horizontal and parallel to said fore-and-aft will be reflected by said central reflector elements in a direction parallel to said incident light rays; and side reflecting means on said side portions of said reflective walls for reflecting incident light rays on said side portions that extend at an acute angle with respect to said fore-and-aft axis with the side reflective means on one of said side portions being operable to reflect incident light rays making an acute angle with said fore-and-aft axis on one side thereof and the side reflective means on the other of said side portions being operable to reflect incident light rays making an acute angle with said fore-and-aft axis on the other side thereof.

3,954,325

MULTILAYER CERAMIC-BASED LIQUID CRYSTAL DISPLAY

Howard C. Borden, La Jolla, Calif., assignor to Ceramic Systems, San Diego, Calif.

Filed May 28, 1974, Ser. No. 473,545
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **5 Claims**



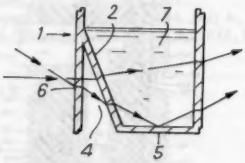
1. An electro-optic display device comprising:
a multiplayer ceramic substrate including a plurality of ceramic layers and at least one cavity therein;
at least one electronic circuit positioned within said at least one cavity in the ceramic substrate;
a metalized layer on a surface of the ceramic substrate, the layer including a plurality of metalized display elements electrically isolated from each other and from the remainder of the metalized layer;
a three-dimensional network of electrical conducting elements buried within the ceramic substrate, the network including at least one electrical conducting layer between adjacent ones of the ceramic layers, and a plurality of elongated electrical conducting elements extending throughout the ceramic layers, the network being interconnected with the electronic circuits and also directly interconnected with the metalized display elements from within the ceramic substrate by means of the elongated electrical conducting elements;
a transparent conducting plate mounted in opposition to the metalized layer, and spaced apart from the metalized layer to form a cell for containing a liquid crystal material, the conducting plate being electrically interconnected with the three-dimensional conducting network; and
a quantity of liquid crystal material within the cell.

3,954,326

TRANSLUCENT BUILDING BLOCKS

Maximilian Gustav Alfred Cecil Michaelis, 13 Quai St. Michel, Paris V, France

Filed Feb. 25, 1974, Ser. No. 445,699
Claims priority, application United Kingdom, Jan. 3, 1974, 273/74
Int. Cl.² E04C 1/42
U.S. Cl. 350—265 **9 Claims**



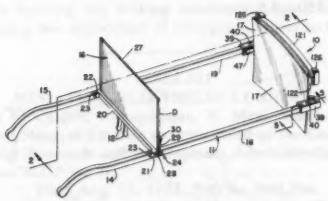
1. An article of manufacture in the form of a hollow translucent block having vertical parallel side walls connected to vertical parallel end walls, the side walls being longer than the end walls, the upper surfaces of said side walls and end walls being at least partially flat for engagement with mating structure on another block adapted to be superimposed thereabove, the lower surfaces of said side walls and end walls being at least partially flat for engagement with mating structure on another block adapted for supporting the same from below, said block having a bottom wall and lacking a top wall, the improvement comprising said bottom wall being partially defined by a horizontal portion and partially defined by a portion oblique to the planes of said side walls, liquid within said block with the upper level of the liquid being below, the upper edge of said side walls and in contact with said oblique portion of the bottom wall, such that said liquid cooperates with said oblique portion to transmit at least some light incident on said side walls through said block by total internal reflection.

3,954,327

DOCUMENT READING APPARATUS

David W. Tibbets, 606 W. 81st St., Apt. E405, Hialeah, Fla. 33014

Filed Apr. 18, 1974, Ser. No. 461,967
Int. Cl.² G02B 5/12
U.S. Cl. 350—298 **7 Claims**



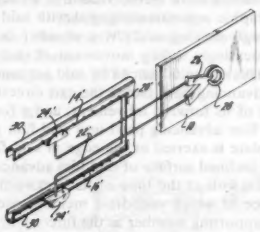
1. A document reading apparatus which may be worn on the head of a user in the manner of a pair of spectacles comprising an elongated frame having a near end which is worn in front of and close to the face of a user and a far end worn in front of and remote from the face of a user, a pair of temples connected to the near end of said frame and engageable over the ears of a user, a pair of spaced nose pads depending centrally from the near end of said frame between said temples and adapted to rest on the nose of a user, a document holder supported on and above said frame, and mirror means supported on said frame for reflecting the image appearing on a document held by said document holder into the eyes of a user, ssid frame including a pair of spaced parallel side bars

having near and far ends, and a crossbar rigidly connecting the near ends of said side bars, there being a separate one of said temples hingedly connected to the near end of each of said side bars so as to swing from an extended position in parallel alignment with one of said side bars to a folded position along side of said crossbar, said pair of nose pads being dependently supported from said crossbar, an open, inverted T-shaped slot formed in said crossbar throughout its length, and extending across said side bars, said slot having an enlarged horizontally elongated head portion having ends opening outwardly of said bars, and a narrow vertical leg portion opening upwardly throughout its length, said document holder comprising a substantially flat upright panel having a horizontally elongated base portion integrally joined to the bottom edge of said upright panel of approximately the same size and shape of said head portion of said slot for sliding within said head portion, and clamping means secured to said base portion and extending upwardly adjacent said upright panel for holding a document against said upright panel, said mirror means comprising a single mirror adjustably mounted between said side bars on the remote side of said document holder to slide on said side bars toward and away from said near end.

3,954,328
EXTENSIBLE REAR VIEW MIRROR

Marc L. Ames, 99 Coventry Circle, Piscataway, N.J. 08854

Filed Dec. 19, 1974, Ser. No. 534,643
Int. Cl.² G02B 5/08
U.S. Cl. 350—304 **3 Claims**

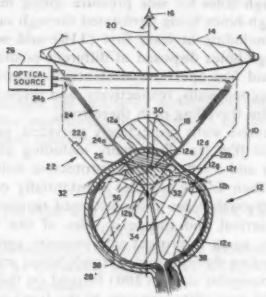


1. A rear-view mirror system for vehicles comprising:
a. A principal mirror;
b. an extensible mirror, smaller in size than said principal mirror; and
c. means for connecting said extensible mirror to said principal mirror so as to enable linear and angular movement of said extensible mirror relative to said principal mirror, said connecting means comprising a U-shaped slide element, said slide element adapted for slidable securement about the edges of said principal mirror, a pair of parallel directed tracks adhered to said U-shaped slide element, said tracks provided with a plurality of regularly spaced notches, said notches on one of said tracks provided in lateral opposition with respect to corresponding notches provided on the other of said tracks, a pair of spring-depressable members, each of said members having at one end thereof a pair of laterally opposed, oppositely directed finger grips adapted for incremental movement in relation to said notches, and a universal joint adhered to the back of said extensible mirror and having its movable element secured to both of the opposite ends of said spring-depressable members, whereby said slidable association of said spring-depressable members and said tracks enables said extensible mirror to move incrementally in a linear direction relative to said principal mirror, while said universal joint provides said extensible mirror with angular movement capacity relative to said principal mirror.

3,954,329
WIDE-ANGLE OPTHALMOSCOPE EMPLOYING TRANSILLUMINATION

Oleg Pomerantzeff, Brookline, Mass., assignor to Retina Foundation, Boston, Mass.

Continuation-in-part of Ser. Nos. 292,150, Sept. 25, 1972, and Ser. No. 512,327, Oct. 4, 1974. This application Dec. 27, 1974, Ser. No. 536,879
Int. Cl.² A61B 3/14, 3/10, 3/12
U.S. Cl. 351—16 **12 Claims**

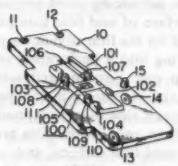


1. In a device for examining an eye fundus under applied illumination, said device having lamp means for illuminating the fundus and a contact lens for viewing the fundus, the improvement in which said lamp means comprises means for directing light onto the sclera of the eye being examined for transmission through the sclera to illuminate the fundus.

3,954,330
FILM GATE UNIT FOR MOTION PICTURE APPARATUS

Keiichi Sakaguchi, and Noritsugu Hirata, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 302,430, Oct. 31, 1972, abandoned. This application Sept. 19, 1974, Ser. No. 507,434
Claims priority, application Japan, Nov. 17, 1971, 46-107524
Int. Cl.² G03B 1/48
U.S. Cl. 352—224 **9 Claims**



1. A film gate unit incorporated in a cinematographic apparatus of a type having a magazine chamber for accommodating a film magazine loaded with cinematographic film, and provided with a film advancing mechanism capable of conveying said film loaded in said magazine chamber, which comprises in combination:
a. a base plate (10) forming one side wall of said magazine chamber, said base plate having the following component members integrally molded therewith of a black synthetic resin of the same quality:
1. a film gate portion (100) raised at the center part of said base plate and whose front surface is formed in a flat planar shape, one portion of said film gate being provided with a film exposure aperture (105) perforated in a rectangular shape through said base plate;

2. film guiding side walls projectingly provided at one side edge of said film gate portion along the travelling path of said film, said film guiding side walls comprising at least first (**101**) and second (**102**) separate side walls in positions bracketing said film aperture;
3. a slit (**106**) for allowing a film advancing pawl to project therethrough, which slit extends in the travelling direction of said film, and is perforated through said base plate along said film gate portion of said base plate;
4. through-holes for side pressure spring members, said through-holes being perforated through said base plate and including at least first (**110**) and second (**111**) through-holes disposed at different positions bracketing said film aperture substantially opposite said first and second walls, respectively, and respectively across the film travelling path therefrom;
5. protective walls projectingly provided, on the margin of said film travelling path, including at least a first (103) and a second (**104**) protective wall at positions with their film gate sides substantially collinear with said through-holes and positioned respectively on the film arrival and film exit sides of the through-hole group, so as to protect side pressure spring members projecting through said through-holes; and
6. a rectangular cavity (**200**) formed on the rear surface of said base plate opposite to the front surface where said film gate portion is provided;

b. a drive member for intermittently advancing said film at said film gate portion, said drive member being movably mounted within said rectangular cavity so as to be capable of sliding for back-and-forth sliding movement in alignment with the travelling direction of said film, and having the following members integrally formed therewith of a resilient material:
1. a drive member plate (**201**), at the center of which there are perforated an opening (**202**) for film exposure disposed at a position corresponding to said base plate film exposure aperture and having its long side in the film travelling direction, the size of said opening being such that, when said drive member performs reciprocating sliding movement, it does not intercept light passing through said film exposure aperture provided in said base plate, and a slot (**203**) for reciprocatingly driving said drive member;
2. a film advancing pawl (**107**) bent from one side edge part of said drive member plate at approximately a right angle toward the rear surface of said base plate, said film advancing pawl projecting outwardly to the front surface of said film gate portion through said slit provided for the film advancing pawl and being capable of entering into a perforation of said film disposed in said film gate portion, and said pawl having, in the portion able to enter into said perforations, an edge on the film exit side at approximately right angles to the film surface and, on the film arrival side, an edge oblique to said film surface; and

c. a holding member (**207**) to hold said drive member in said rectangular cavity of said base plate, said holding member being disposed along the side edge of the drive member opposite the edge thereof from which said film advancing pawl extends, and having the following component members integrally formed therewith of a resilient material:
1. a fixing portion for maintaining and positioning said holding member at the rear surface of said base plate;
2. an extension (**209**) extending from said fixing portion, so that the free end of said extension contacts said drive member at a position thereof close to the locus, along which said film advancing pawl is shifted in the film travelling direction in such a manner that, when said drive member is subjected to its reciprocating slide movement, said extension may exert a force to cause said film advancing pawl to project from said film gate front surface in said locus;
3. side pressure portions for urging an edge of said film towards said film guiding walls when said film travels on said film gate portion, said side pressure portions being bent from said fixing portion toward the rear surface side of said base plate, and including a first side pressure portion (**109**) projecting past said film gate front surface through said first through-hole to constitute a side pressure spring member, and a second side pressure portion (**108**) projecting past said film gate front surface through said second through-hole to constitute a second side pressure spring member, said first and second side pressure portions being spring-energized to exert a force in the direction of said film guiding side walls (**101,102**);
4. supporting members (**210,211**) for shifting said drive member with the other side edge part opposite to the side edge part where said film advancing pawl is provided and for operating as fulcrum for said drive member to allow the drive member to swing when said drive member and the film advancing pawl thereof are subjected to reciprocating movement and a force tending to urge the tip of said pawl back into said film gate portion of said base plate is exerted by engagement between the tip end of said film advancing pawl and the edge of a film perforation or the portion of film between perforations, at least part of said respective supporting members being spring-energized in the direction of the rear surface of said base plate and thereby holding said drive member at said base plate, while it swings on said supporting members as a fulcrum,

whereby, when a drive member control means (**204**) of said cinematographic apparatus engaged with said slot (**203**) for reciprocatingly driving said drive member is actuated, and said reciprocatingly sliding movement of said drive member takes place, said film advanced by said perpendicular edge of said film advancing pawl facing the exit direction of said film at the time of its forward movement, and a force to shift the tip of said film advancing pawl into said film gate portion of said base plate is exerted at the edge of said film perforation where said inclined surface of said film advancing pawl makes contact therewith at the time of its backward movement, in consequence of which said drive member oscillatingly shifts with said supporting member as the fulcrum to cause said film advancing pawl to escape into said slit in film gate portion of said base plate, and, further, during said backward movement of said pawl, said film is maintained by said film guiding side walls and said side pressure of said holding member portions so as not to move from its position in said film gate portion, and, at the same time, said protective wall protects said side pressure portion of said holding member from any possible deformation due to forcing by said magazine by improper loading of said magazine.

3,954,331

TONER DISPENSER

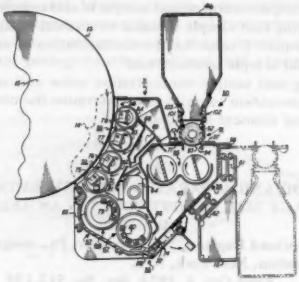
Richard E. Smith, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 20, 1974, Ser. No. 525,527
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 DD **12 Claims**

6. A toner dispensing arrangement comprising:
a hopper having an inlet opening and an outlet opening,
means for pivotally mounting said hopper for movement between a toner dispensing position and a toner loading position,
dispensing control means mounted in said hopper intermediate said inlet and outlet openings for preventing the passage of toner through said hopper when in a first condition and for permitting the passage of toner, on demand, through said hopper when in a second condition,

a container for storing a supply of toner, said container having a discharge port, and

coupling means for attaching said container to said hopper so that toner may flow from said container into said inlet



opening when said hopper is in the toner dispensing position and may flow away from said discharge opening when said hopper is in the toner loading position, whereby said container may be attached and detached from said hopper without toner spillage.

3,954,332

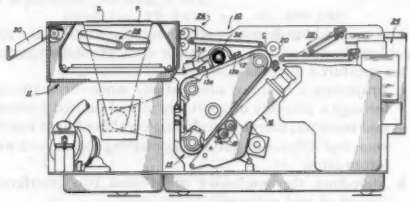
REPRODUCTION MACHINE WITH IMPROVED TRANSFER ROLL

Donald J. Fisher, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1975, Ser. No. 540,301

Int. Cl.² G03G 15/22

U.S. Cl. 355—3 R **4 Claims**



1. An electrostatic reproduction machine having a photoreceptor, means for producing a developed electrostatic image on the photoreceptor, and an improved electrically biased transfer roll for transferring the image from the photoreceptor to a support member during operation of the machine, the improvement comprising means for maintaining the resistivity of the roll within a desired range during operation of the machine.

3,954,333

TRANSFER ROLL HAVING MEANS FOR MONITORING AND CONTROLLING THE RESISTIVITY THEREOF

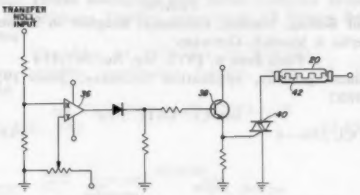
Narendra S. Goel, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1975, Ser. No. 540,302

Int. Cl.² G03G 15/22

U.S. Cl. 355—3 R **2 Claims**

1. An electrostatic reproduction machine having a photoreceptor, means for producing a developed electrostatic image on the photoreceptor, and an improved electrically biased transfer roll for transferring the image from the photoreceptor to a support member during operation of the machine, the improvement comprising means for maintaining the resistivity of the roll within a desired range regardless of ambient temperature changes, the resistivity maintaining means comprising means for monitoring the resistivity of the transfer roll during ambient temperature changes.



3,954,334

APPARATUS FOR RECORDING WITH A LENTICULAR GRATING

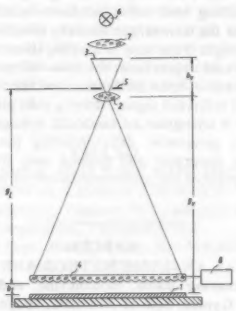
Friedrich Bestenreiner, Grunwald, and Reinhold Deml, Munich, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Mar. 22, 1974, Ser. No. 453,982

Claims priority, application Germany, Mar. 31, 1973, 2316196

Int. Cl.² G03B 27/68, 27/76

U.S. Cl. 355—52 **5 Claims**



1. A copying apparatus, comprising, in combination, holding means for holding an original and a photosensitive copying material in spaced predetermined positions stationary relative to each other for the making of a copying exposure; a lenticular grating arranged intermediate the original and the copying material; image forming means operative for illuminating the original; an objective directing light leaving the illuminated original towards the copying material through said lenticular grating to form upon the copying material a raster-like light image of the original; and shifting means for controlling the gradation (reducing the raster-like character) of the image recorded on the copying material (despite the raster-like character of the light image formed thereon) by shifting said grating during the copying exposure relative to the original, the objective and the copying material while the latter remain stationary and by a shift distance less than one half the raster constant of said grating to effect corresponding shifting of the raster-like light image formed upon the copying material during the copying exposure so as to effect a limited and controlled smearing of the image recorded on the copying material and thereby control the gradation of the image recorded on the copying material.

3,954,335

METHOD AND APPARATUS FOR MEASURING RANGE AND SPEED OF AN OBJECT RELATIVE TO A DATUM PLANE

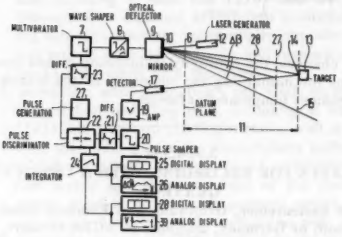
Viktor Bodlaj, Munich, Germany, assignor to Siemens AG, Berlin & Munich, Germany

Filed June 6, 1973, Ser. No. 367,414

Claims priority, application Germany, June 19, 1972, 2229887

Int. Cl.² G01C 3/08

U.S. Cl. 356—4 15 Claims



1. Method of rapidly measuring the range of an object from a datum plane and its speed component perpendicular to the datum plane comprising transmitting a laser beam, periodically deflecting said laser beam through the space in which the object is located by a piezoelectric beam deflector having an oscillatory mirror, diffusely reflecting said laser beam by the object, detecting said reflected laser beam by a detector mounted near the transmitter whereby said detector is capable of receiving light from only a specific direction, determining the range to said object from the time difference between the commencement of beam deflection and the time said detector receives said reflected signal, driving said piezoelectric beam deflector by a triangular or sawtooth voltage derived from a square wave generator, differentiating the output of said square wave generator and passing only the positive going pulses to represent the commencement of said beam deflection.

3,954,336

CHEMICAL ANALYSIS METHOD AND APPARATUS

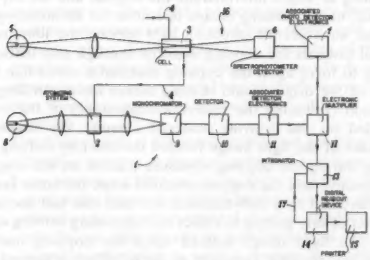
Graeme Alexander Baird, Erskineville, and Nicholas James Marshall, Gymea, both of Australia, assignors to Australian Selection, Sydney, Australia

Filed Oct. 23, 1973, Ser. No. 408,450

Claims priority, application Australia, Oct. 27, 1972, 1003/72

Int. Cl.² G01N 1/00

U.S. Cl. 356—36 12 Claims



1. A method of chemical analysis of a sample which includes an element of interest, including the steps of;

adding a measured quantity of a dye to a solution containing a known quantity of said sample;

measuring the optical density of said dyed sample solution;

comparing said optical density of the sample solution with the optical density of a standard solution having a known dye concentration, and thereby determining a value for the concentration of said sample in said sample solution;

subjecting said sample solution to spectral analysis so as to determine a value for the concentration of said element in said sample solution; and

relating said sample concentration value and said element concentration value so as to determine the concentration of said element in said sample.

3,954,337

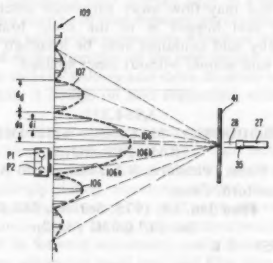
METHOD AND APPARATUS FOR DETERMINING THE AVERAGE SIZE OF APERTURES IN AN APERTURED MEMBER

Frank Rowland Ragland, Jr., Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,135

Int. Cl.² G01B 9/02

U.S. Cl. 356—109 10 Claims



1. A method for determining the average width of the apertures in a limited portion of a regular array of similar apertures in an apertured member, said method comprising

a. projecting a beam of substantially monochromatic light through a plurality of apertures in said limited portion of said member, thereby producing combined light interference and diffraction patterns containing the desired width information,

b. detecting the intensities of at least two interference fringes of said patterns,

c. generating electrical signals which are representative of said detected intensities, and then

d. deriving from said generated electrical signals the average width of said apertures through which the beam has passed.

3,954,338

MOUNTING OF OPTICAL FIBRES OR OTHER FILAMENTS IN AXIAL ALIGNMENT WITH ONE ANOTHER OR WITH OTHER ELEMENTS

Geoffrey Frank Hennel, Iver Heath, and Robert Henry Tappin, Old Windsor, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Sept. 4, 1974, Ser. No. 503,059

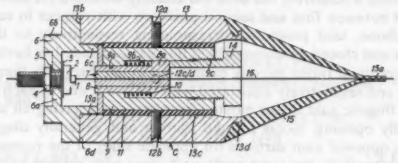
Claims priority, application United Kingdom, Sept. 6, 1973, 41947/73

Int. Cl.² G01B 11/26

U.S. Cl. 356—138 17 Claims

4. A connector member for coupling an optical filament in substantial axial alignment with a complementary optical element having a coupling face arranged substantially on, and at right angles to, the axis of a complementary connector member, said connector member comprising a holder body

having means for securing therein a filament to extend along a given line in said body, said holder body having a circumferential external surface coaxial with said line; a housing provided with means for location of said housing in substantially coaxial relation to such complementary connector member and thus to the complementary element to which said fibre is to be coupled, said housing having a circumferential wall forming a passage accommodating said circumferential surface with radial clearance; coaxial sleeve means interposed between said passage-forming wall and said circumferential



surface and taking up the whole of said clearance, said sleeve means consisting of a material that is resiliently deformable in the manner of an elastomer; and two adjustment means arranged for operation in a common radial plane between the two ends of the sleeve means for action between said housing and holder body to produce displacement of the latter, relative to the housing, respectively in two mutually transverse directions both perpendicular to said line of filament, the consequential elastic deformation of the sleeve means ensuring the maintenance of a mutually parallel relation of the respective axes of the housing and holder body.

3,954,339

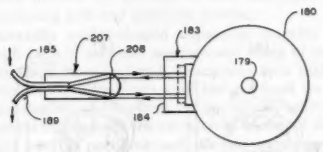
ANGULAR SENSOR

John G. Atwood, Redding, and Charles F. deMey, II, West Redding, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 22, 1974, Ser. No. 499,595

Int. Cl.² G02B *27/24, 5/14*

U.S. Cl. 356—152 **4 Claims**



1. Apparatus for sensing the angular position of a rotational member, comprising:

a. a retro-reflector mounted on said rotational member and having an array of roof edges with the roof lines in a plane parallel to the axis of rotation of said member;

b. a group of optical fibers divided into pairs;

c. a light detector for each pair of optical fibers;

d. a collimator unit for each pair of fibers, including a collimating lens, each pair of fibers having corresponding ends connected to said collimator unit with said ends at conjugates with respect to the focus of said lens, the opposite ends of one fiber of each pair being operatively coupled to a respective one of said light detectors and the opposite end of the other fiber of each pair being exposed to a source of light, said collimator unit being positioned with said lens viewing said retro-reflector and with said corresponding fiber ends disposed in a plane perpendicular to said axis.

3,954,340

METHOD OF AND APPARATUS FOR TARGET TRACKING

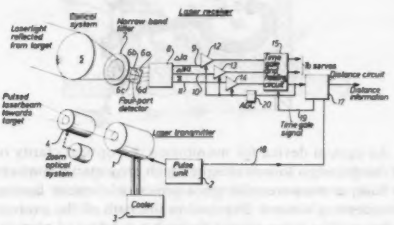
Åke Hugo Petrus Blomqvist, and Bertil Torbjörn Eriksson, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Mar. 11, 1974, Ser. No. 450,172

Claims priority, application Sweden, Mar. 13, 1973, 7303520

Int. Cl.² G01B *11/26;* **G01J** *1/20*

U.S. Cl. 356—152 **15 Claims**



1. In a method of optical target tracking including the projecting of light radiation emitted or reflected from a target by an optical system on a light-sensitive detector arranged in a detector plane to produce an image of the target extending on the surface of the detector and the generating of control signals to direct the optical system towards the target to track the target depending on the position of the target image on the surface of the detector, the improvement comprising intentionally and positively defocussing the target image on the detector surface as a function of a parameter associated with the target so that variations of the extension of said target image on the detector surface during a tracking procedure are substantially reduced.

3,954,341

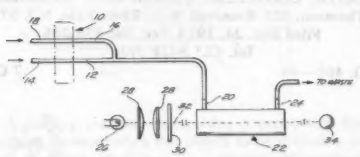
LIQUID SAMPLE ANALYZER WITH IMPROVED OPTICAL CHARACTERISTICS

Kenneth F. Uffenheimer, Yonkers, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,829

Int. Cl.² G01N *1/10*

U.S. Cl. 356—181 **7 Claims**

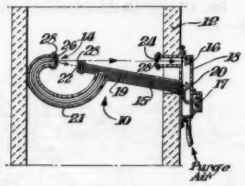


1. A photometric system comprising: a source of different blood samples treated with a same reagent, means for flowing said samples successively along a conduit from said source in isolated condition from another, a flow cell in said conduit having a tubular wall structure formed at least internally with a portion defining a straight sight path through which said samples flow, a light source, means directing a ray from said light source so as to pass said ray through said sight path for detection of said ray, and photodetection means successively measuring at a particular wavelength the light absorbance of said samples in said sight path, said samples having a first index of refraction, said flow cell portion having a second index of refraction which is less than said first index of refraction.

3,954,342
OPTICAL DEVICE FOR MONITORING CLARITY OF A FLUID

Jan Boeke, P.O. Box 2511, Chapel Hill, N.C. 27514

Filed Mar. 28, 1974, Ser. No. 455,558
Int. Cl.² G01N 21/12
U.S. Cl. 356—206 30 Claims

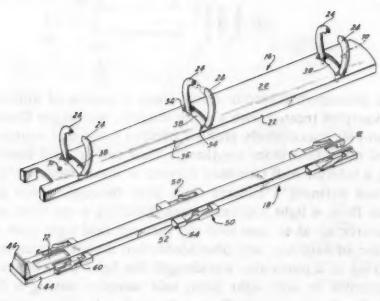


1. An optical device for monitoring the optical clarity of a fluid comprising a source of light which projects a beam across said fluid, a measurement photosensitive element having a light-accepting window disposed in the path of the projected light beam after it has passed through a substantial portion of said fluid for providing a measurement signal which represents the amount of said projected light beam passing through said fluid, a reference photosensitive element having a light-accepting window disposed closely adjacent said source of light and in the path of light projected through said fluid for providing a reference signal, a reference integrating electrical circuit connected to said reference photosensitive element for collecting and storing said reference signal, a measurement integrating electrical circuit connected to said measurement photosensitive element for collecting and storing said measurement signal, switching means having a predetermined tripping signal parameter, said switching means having an input connected to said reference integrating circuit, said switching means having an output connected to said measurement integrating circuit for disconnecting said measurement integrating circuit from said measurement photosensitive element to terminate collection and storage of said measurement signal, and readout means connected to said measurement integrating circuit for providing a reading of the measurement signal stored in said measurement integrating circuit during the period required to trip said switching means whereby the clarity of said fluid is indicated.

3,954,343
PLASTIC LOOSELEAF BINDER RING ASSEMBLY

John Thomsen, 535 Roosevelt Ave., River Vale, N.J. 07675

Filed Dec. 24, 1974, Ser. No. 536,206
Int. Cl.² B42F 3/04
U.S. Cl. 402—41 7 Claims

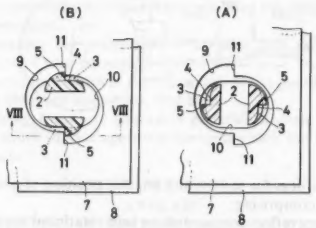


1. A looseleaf binder ring assembly comprising a one-piece backbone formed of a resilient plastic material; said backbone having a bight portion defining upper and lower surfaces, a plurality of apertures formed in its bight portion, and a plurality of pairs of cooperating fingers formed integrally therewith and extending through said apertures, the fingers of each pair facing one another and being pivotally connected to the backbone by integral flexible webs; said fingers having upper looseleaf holding portions extending from said opening above the upper surface of the backbone and lower end portions extending generally vertically downwardly through said openings to positions below said lower surface; said fingers being pivotable between open and closed positions of said looseleaf holding portions, a relatively flat slide bar slidably mounted for movement between first and second positions with respect to said backbone, said positions corresponding respectively to the open and closed positions of said fingers; said slide bar having a plurality of finger moving members formed integrally therewith and respectively associated with the lower end of each of said fingers; said finger moving members each having an upwardly opening recess formed therein and generally diagonally opposed cam surfaces on opposite sides of the recesses in substantially the same horizontal plane with respect to the generally vertically extending lower end portions of their associated fingers, said cam surfaces extending angularly in said horizontal plane with respect to the direction of sliding movement of said bar; said lower end portions of said fingers extending into said recesses and with opposite sides thereof being respectively engaged by the generally diagonally opposed cam surfaces associated therewith in the first and second positions of the slide bar, one of said cam surfaces engaging one side of its associated finger and holding it in its open position when the side bar is in its first position and the other of said cam surfaces engaging another side of its associated finger and holding it in its closed position when said slide bar is in its second position

3,954,344
COUPLING MECHANISM

Daiji Nakama, Usunomiya, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed Mar. 26, 1975, Ser. No. 562,078
Claims priority, application Japan, Mar. 30, 1974, 49-35635
Int. Cl.² A44B 17/00
U.S. Cl. 403—14 1 Claim



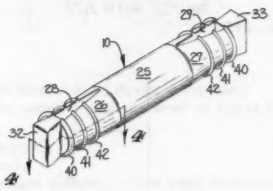
1. In a coupling mechanism for uniting two plates which comprises a coupling member and cooperatively engaging apertures in said plates, said coupling member being integrally formed of synthetic resin to have an umbrella-shaped head portion (1) having a knob (6) at the upper portion thereof and two legs (2,2) each having a stepped engaging portion (3) on the periphery thereof and perpendicularly extending from the underside of said head portion, whereby overlying upper and lower plates (7,8) are coupled by inserting said two legs through their aligned elliptical apertures (9,10) and rotating said knob by 90° to cause said stepped engaging portions to move toward and engage with the underside of said lower plate (8) at the short-diametric opposing portions of the aperture thereof, the improvement wherein said coupling member

further comprises stopping projections (5,5) each provided on the neck portion (4) above said stepped engaging portion (3) of the leg (2) and the aperture in said upper plate (7) is provided with stepped stopping portions (11,11) on said upper aperture the shape which is formed by laying two quadrants of a circle in symmetrical opposing relation contiguous with respect to the center of an elliptical aperture and enlarging the elliptical aperture by removing the portions of the upper plate underlying the excursion areas of the quadrants which extend beyond the elliptical aperture, whereby said stopping projections (5,5) engage with stopping portions (11,11) to stop the rotation of said coupling member at 90°.

3,954,345
SELF-LOCKING DOWEL PIN

Max O. Morris, 582 E. Sunset Highway, Issaquah, Wash. 98027

Filed Feb. 27, 1975, Ser. No. 553,797
Int. Cl.² E04B 1/48
U.S. Cl. 403—297 **1 Claim**



1. A self-locking dowel pin of one-piece, integral, high impact plastic construction suitable for use in assembling abutting furniture components comprising:

a central portion of predetermined generally cylindrical configuration;

end portions extending longitudinally outwardly from each of said central portions and being of initially generally frusto-conical configuration of outwardly reducing cross-sectional dimensions along the lengths thereof;

a generally V-shaped cutout formed in each of said end portions and extending longitudinally inwardly from the ends thereof for splitting of said end portions and for rendering said end portions flexible;

a generally wedge-shaped expansion member associated with each of said end portions and being of larger predetermined cross-sectional dimensions than said cutout for being force fitted into said end portions for expanding said flexible end portions to generally cylindrical configurations of generally the same cross-sectional dimension as said central portion, each of said expansion members including integral connections to the ends of said end portions which may be easily ruptured when said expansion members are forced into said cutouts for expanding said end portions; and

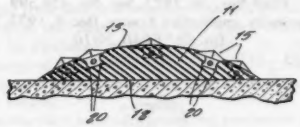
a plurality of spaced-apart, inwardly facing, generally saw-tooth shaped flange members extending circumferentially around the outside of said end portions and being of varying heights from the outside surface of said end portions terminating along longitudinally-extending, tangential axes extending from said cylindrical central portion for defining a cylindrical plane around said end portions of generally the same cross-sectional dimensions as said central portion prior to expansion of said end portions by said wedge-shaped expansion members;

whereby, said dowel pin may be inserted into and extend through mating cylindrical shaped bores of abutting furniture components which are slightly larger than the cross-sectional dimensions of the central portion of said dowel pin and said wedge-shaped expansioh member may be force-fitted into said V-shaped cutouts for expanding said end portions and for forcing said flange members into biting engagement with the surfaces of the bores for locking of said dowel pin within the mating bores for holding the furniture components in assembled condition.

3,954,346
SAFETY STRIP

George W. Miller, 247 Amherst St., East Orange, N.J. 07018

Filed Dec. 9, 1974, Ser. No. 530,533
Int. Cl.² E01F 9/04
U.S. Cl. 404—16 **2 Claims**

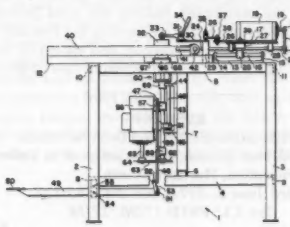


1. In a safety strip, the combination of a length of wear-resistant white rubber strip securable to a pavement or roadway by a rubber-based cement, and means for easily seeing said strip at night and particularly on rainy nights said strip having a cross-sectionally upwardly rounded upper surface, said means comprising a series of multi-faceted, diamond-shaped glass reflectors protruding upwardly from said upper surface of said strip, said reflectors being anchored in said strip by lengths of rods, each said reflector incorporating a downward extending stem, each stem having a transverse opening therethrough receiving said rod, and said rods extending along a longitudinal direction of said strip.

3,954,347
DRILLING MACHINE

Emmanuel Mechalas, Danville, Ill., assignor to Modern Machine Shop Inc., Danville, Ill.

Filed Sept. 25, 1974, Ser. No. 509,240
Int. Cl.² B23B 41/00, 51/00
U.S. Cl. 408—31 **6 Claims**



1. A drilling machine comprising a supporting frame for supporting horizontally a flat object to be drilled, a drill supported on said frame and reciprocally movable in the plane of the object being drilled, means to move said drill into and out of the edge of said flat object, a hollow hole cutter supported on said frame below the plane of said flat object and movable reciprocally in a vertical direction, means to move said hole cutter vertically to cut a hole in said flat object from the underside thereof intersecting the hole made by said first-named drill, and said hole cutter comprising a hollow cylindrical member having cutter teeth around the upper end thereof, said teeth having the initiating cutting edge lying along a projection of the inner surface of said cylindrical member, and having an enlarged support comprising a first supporting member having a hollow opening receiving and supporting said hollow cylindrical member, a second supporting member spaced from said first supporting member by a distance greater than the thickness of said flat object and having a shaft

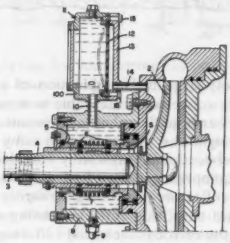
for connection to rotary driving means, and a plurality of spaced supporting members securing said first and second supporting members and defining equally spaced openings of size greater than the diameter of the core cut by said hole cutter sufficient to eject the core cut by movement of said hole cutter through said flat object.

3,954,348

DEVICES FOR RENDERING PUMPS TIGHT

Georges Renaud, Nogent-sur-Marne, France, assignor to Pompes Multiflux, Societe Anonyme, Paris, France

Filed Nov. 30, 1973, Ser. No. 420,599
Claims priority, application France, Dec. 8, 1972, 72.43719
Int. Cl.² F04D 29/10
U.S. Cl. 415—113 **2 Claims**



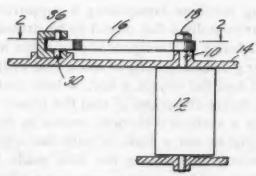
1. In a pump having a rotor mounted on a rotor shaft for rotation therewith, a device for insuring the tightness of the pump comprising a first housing, a first chamber within the first housing containing an auxiliary fluid and surrounding the rotor shaft, packings disposed between the said first housing and the rotor shaft to form a fluid tight seal therebetween, a second housing enclosing a second and third chamber, said second housing being formed by two separate casings having edges secured together, a supple elastically deformable membrane having its edges gripped between said edges of the housing and separating the said second and third chambers, said edges of the membrane sealing the joint between the edges of the casings, means for connecting the first and second chambers for fluid flow therebetween, and means for connecting the third chamber and the high pressure side of the pump.

3,954,349

LEVER CONNECTION TO SYNCRING

Robert N. Abild, New Britain, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed June 2, 1975, Ser. No. 583,128
Int. Cl.² F01D 17/00, 17/16
U.S. Cl. 415—163 **4 Claims**



1. In an axial flow compressor having a casing, a row of vanes carried by said casing and positioned substantially radially therein, each vane of the row being turnable on its radial axis to change the angle of the vane, and a ring positioned on and extending around the casing, said ring by circumferential movement actuating the vanes, in combination with actuating means for each of the vanes including:

a lever attached to the vane and moving therewith, said lever having a slot in the end remote from the vane, said slot having opposed cylindrical side surfaces,

a block slidably fitting in said slot and having opposed cylindrical sides cooperating with the surfaces of the slot, the cylindrical axis of the slot surfaces and block surfaces being parallel to the longitudinal axis of the lever, said block having a central hole therethrough at right angles to the cylindrical axis, and

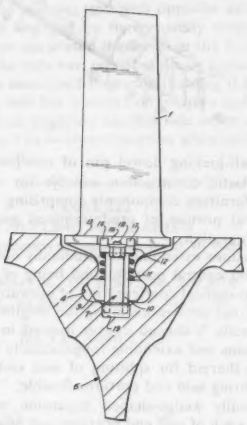
a pin carried by and positioned substantially radially of the ring on the casing and extending through the central hole of the block.

3,954,350

ROTOR HAVING MEANS FOR LOCKING ROTOR BLADES TO ROTOR DISK

Gerhard Zahring, Munich, Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Germany

Filed June 5, 1975, Ser. No. 584,095
Claims priority, application Germany, June 14, 1974, 2428775
Int. Cl.² F01D 5/32
U.S. Cl. 416—215 **4 Claims**



1. A rotor for a fluid flow machine comprising:

a. a rotor disk having a circumferential groove, the groove having a recess in its bottom wall,

b. a plurality of blades spaced apart circumferentially around the disk, each blade having a platform extending laterally from it and a root depending from the platform and retained in the groove, a slot being formed between two of the platforms, and

c. a locking means between two of the blades for maintaining the blades against circumferential movement with respect to the disk, said locking means including:

I. a part within the groove and engaging the walls thereof,

II. a retaining element movable with respect to said part in the radial direction of the disk, the retaining element also being rotatable about an axis lying along a radius of the disk,

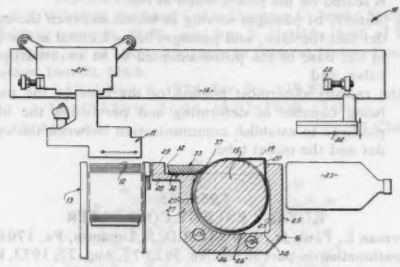
III. tabs projecting radially outwardly from the retaining element, the tabs being accommodated by said slot in one angular position of the retaining element, and in another angular position of the retaining element the tabs being beneath the platforms of the two blades between which the locking means is located and the radially inner end of the retaining element being in the recess in the bottom wall of the groove.

3,954,351

LIQUID LEVEL RESERVOIR CONTROL

Charles H. Scholl, Vermilion, and Alan B. Reighard, Bay Village, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Dec. 27, 1974, Ser. No. 536,731
Int. Cl.[2] F04B 49/00
U.S. Cl. 417—40 15 Claims



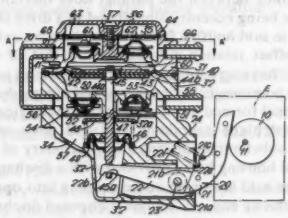
1. A liquid level control device comprising
a reservoir within which the level of liquid is to be controlled,
a liquid source,
a surge tank,
conduit means defining a flow path from said surge tank into said reservoir, said conduit means being so positioned relative to said surge tank and said reservoir that liquid flows from said surge tank to said reservoir via gravity flow,
a reciprocating piston pump for supplying liquid from said source to said surge tank,
a movable sensing element located within said surge tank and adapted to enter and displace a volume of liquid within said surge tank, and
control means responsive to the position of said sensing element in said surge tank to actuate said reciprocating piston pump.

3,954,352

DIAPHRAGM VACUUM PUMP

Toshimitsu Sakai, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 10, 1973, Ser. No. 405,175
Claims priority, application Japan, Nov. 13, 1972, 47-113687
Int. Cl.[2] F04B 45/04, 3/00
U.S. Cl. 417—244 4 Claims



1. In a diaphragm vacuum pump for a vehicle, comprising:
a pump housing mounted on a body portion of the vehicle and including thereon an inlet port connected to a pneumatically operated device and an exhaust port connected to the atmosphere;
a diaphragm piston assembly hermetically assembled within said housing to form a first and a second pressure reduction chambers respectively at the faces thereof, said first and second chambers being connected respectively with said inlet and exhaust port;
a first valve means assembled within said first chamber and including a first suction valve to pass air from said pneumatically operated device into said first chamber through said inlet port and a first exhaust valve to a discharge said air into said second chamber;
a second valve means assembled within said second chamber and including a second suction valve to pass air exhausted from said first chamber into said second chamber by way of said first exhaust valve and a second exhaust valve to discharge said air externally, the suction and discharge of said second valve means being conducted in an opposite cycle to the suction and discharge of said first valve means;
a communication means for providing pneumatic communication between said first and second chambers by conducting the air exhausted by said first exhaust valve to said second suction valve;
an operation rod for reciprocating said diaphragm piston assembly for subsequently producing vacuum in said first and second pressure reduction chambers;
a drive mechanism driven by the prime engine of the vehicle for operating said operation rod;
a resilient means to bias said diaphragm piston assembly to its original position against the operation torque from said drive mechanism by way of said operation rod,
the improvement wherein said resilient means is assembled outside of said first and second chambers within said pump housing and comprises a coil spring interposed between a portion of said operation rod and a portion of the inner wall of said housing to bias said diaphragm piston assembly toward said second chamber from said first chamber and wherein said drive mechanism comprises an eccentric cam secured on a drive shaft driven by the prime engine, a drive arm swingably pivoted on a portion of said pump housing to engage with said eccentric cam at one end thereof, an interlocked arm swingably pivoted co-axially with said drive arm at one end thereof to be connected with said operation rod at the other end thereof and biasing means for constantly maintaining the engagement between the end of said drive arm and said eccentric cam, said drive and interlocked arms being interlocked to each other to effect the engine torque transmission from said eccentric cam and to disable the engine torque transmission in the return strokes of said operation rod and said first and second chambers are formed with a shape symmetrical to each other.

3,954,353

AXIAL PISTON PUMP

Ludwig Anton Mokesch, Romerstrasse 31, 7580 Buhl, Baden, Germany

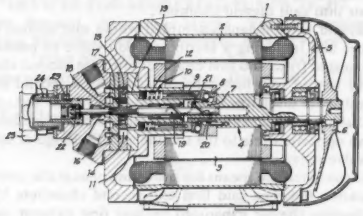
Filed Sept. 3, 1974, Ser. No. 502,292
Claims priority, application Germany, Sept. 17, 1973, 2346646
Int. Cl.[2] F04B 1/06, 1/12
U.S. Cl. 417—269 3 Claims

1. Axial piston pump including:
a housing;
a shaft rotatably mounted in said housing and having a first portion and a second portion, both portions having a common longitudinal axis;
a plurality of axially extending cylinders having their longitudinal axes arranged in parallel relation, said cylinders having inlet ports and outlet ports;
a piston reciprocable in each of said cylinder;
an inclined swash plate mounted on said first shaft portion and engaging said pistons so as to produce a reciprocating

motion of said pistons upon rotation of said first shaft portion;

an eccentric member mounted on said second shaft portion in such a manner that it is slidable but not rotatable thereon;

an annular distributing member mounted on said eccentric member and arranged to control said inlet and outlet ports;



a reciprocating shifting device coupled with said second shaft portion to impart a reciprocating motion to said second shaft portion;

and means intercoupling said first and second shaft portions in such a manner that a longitudinal shift of said second portion produced by said reciprocating shifting device imparts an angular movement to said second shaft portion and therefore to said eccentric and to said distributing member.

3,954,354

SLIDING PISTON PUMP, ESPECIALLY FOR VAPOURIZERS

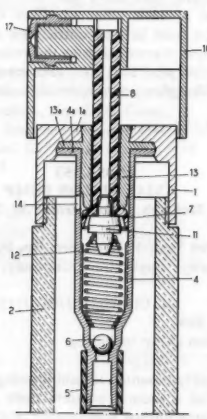
Michel Boris, Paris, France, assignor to Societe Technique de Pulverisation, Paris, France

Filed Mar. 18, 1974, Ser. No. 451,918

Claims priority, application France, Mar. 28, 1973, 73.11852

Int. Cl.² F04B *43/00, 21/04, 39/10*

U.S. Cl. 417—479 **6 Claims**



1. A pump comprising:

a cylinder,

an aperture providing an inlet formed in said cylinder,

a hollow piston having a base slidably mounted in the cylinder and defining a valve seat,

an outlet tube communicating with the cylinder and coaxial therewith, said outlet tube being integral with said piston,

a valve which, at rest, is seated on said valve seat, said valve having an area less than that of the area of the base of said piston,

a spring biasing the valve onto the seat in which position communication between the cylinder and the tube is prevented, said piston taking the form of a shallow cup and being movable with the outlet tube so that the valve is seated on the piston when at rest,

a plurality of passages serving as bleeds between the cylinder and the tube, said passages being formed in the part of the base of the piston adapted to be covered by the valve, and

the radially outermost portion of the base of the piston being capable of deforming and permitting the bleed passages to establish communication between the cylinder and the outlet tube.

3,954,355

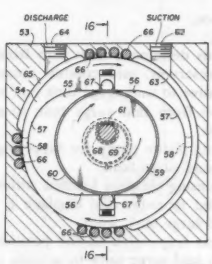
ROTARY ENERGY CONVERTER

Herman L. Paul, Jr., Box 344 R.D. 5, Lebanon, Pa. 17042

Continuation-in-part of Ser. No. 392,072, Aug. 27, 1973, Pat. No. 3,876,348. This application Nov. 1, 1974, Ser. No. 519,921

Int. Cl.² F04C *23/00, 27/00, 17/00*

U.S. Cl. 418—9 **11 Claims**



1. In a rotary compressor wherein is provided a fixed housing provided with a cylindrical chamber for receiving and operably supporting a primary rotor, a circular primary rotor mounted within the cylindrical chamber of said housing for rotation about it own fixed axis, said primary rotor being provided with a symmetrical diametrically-extending parallel-sided chamber, the opposed ends of said parallel-sided chamber being closed by arcuate end walls each of which is provided with an end port extending into open communication with the exterior of said primary rotor, and a circular secondary rotor operably positioned within the chamber of said primary rotor between the parallel sides thereof, said secondary rotor being eccentrically affixed to a drive shaft operably mounted in said housing for rotation about an axis disposed in parallel offset relation with respect to that of said primary rotor; said housing being provided with an inlet port extending into open communication with one end of a medianly disposed inlet channel formed in the wall of said cylindrical chamber in the general plane containing said end ports and extending around a substantial portion of the periphery of said primary rotor, said housing being provided with a discharge port separated from said inlet port and extending into open communication with one end of a medianly disposed discharge channel, complementary to said inlet channel, formed in the wall of said cylindrical chamber and extending around a portion of the periphery of said primary rotor generally opposite to that portion thereof embraced by said inlet channel, said secondary rotor being provided with a slip-ring seal mounted on the periphery thereof, the mid portions of the parallel walls of said parallel-sided chamber being provided with seal means for

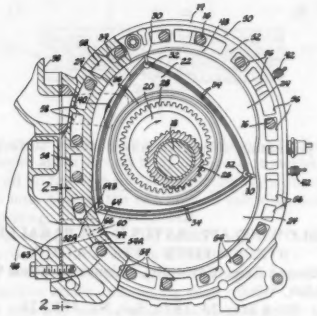
operative engagement with said slip-ring seal, said compressor also including a plurality of circumferentially spaced roller seals operably mounted in the wall of said cylindrical chamber for sealing engagement with the outer face of said primary rotor.

3,954,356

ROTARY ENGINE ROTOR HOUSING HAVING COOLANT COOLED BRIDGED EXHAUST PORT

Frank J. Winchell, Orchard Lake; Clarence C. Irwin, Sterling Heights; Jerry R. Mrlik, and Roy S. Cataldo, both of Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 1, 1974, Ser. No. 519,813
Int. Cl.² F01C *21/06, 19/02;* **F02B** *53/00*
U.S. Cl. 418—83 **15 Claims**



1. A rotary combustion engine rotor housing having radially spaced inner and outer peripheral walls joined by a plurality of ribs, a rotor having apex seals that slide on said inner peripheral wall, said walls and ribs defining a plurality of rotor housing coolant passages extending axially through said rotor housing between said walls and on opposite sides of said ribs, one of said ribs having a cross section outline larger than the others, two of said rotor housing coolant passages extending at substantially different elevations on opposite sides of said one rib, an exhaust port extending through said one rib and said walls, said inner peripheral wall having a coextensive bridge spanning said exhaust port for supporting said apex seals between their ends as they slide over said exhaust port, and bridge coolant passage means for providing a bridge coolant passage of varying elevation through said bridge that is open at its opposite ends at substantially different elevations to said two rotor housing coolant passages whereby coolant is heated while in said bridge coolant passage and rises to effect coolant flow therethrough from the connected rotor housing coolant passage at the lower elevation to the connected rotor housing coolant passage at the higher elevation.

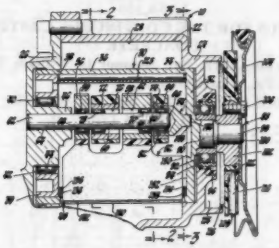
3,954,357

AIR PUMP PIVOT PIN RESTRAINT

Herbert E. Ziehl, Bridgeport, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 24, 1974, Ser. No. 473,128
Int. Cl.² F01C *19/00*
U.S. Cl. 418—138 **3 Claims**

1. In a rotary vane compressor of the type including a housing having a circular cavity therein closed at one end by a cover plate that fixedly supports a cantilevered pivot pin centrally of the housing cavity and further including a cylindrical rotor located eccentrically of the circular cavity having an inner end face and having a rotor drive shaft formed eccentrically of the pivot pin to drive radial vanes pivotally supported on the pin for rotation relative thereto and through a vane path that sweeps a crescent-shaped pump chamber between the housing and the rotor to draw fluid from an inlet chamber for discharge through an outlet chamber, the improvement comprising: means forming a circular guide track in the inner end face of said rotor located concentrically of said rotor shaft and eccentrically with respect to the axis of said pivot pin, a vane hub having a bore therethrough supported in spaced relationship to the free end of said pivot pin, a pivot pin restraint member including an open ended tubular end portion



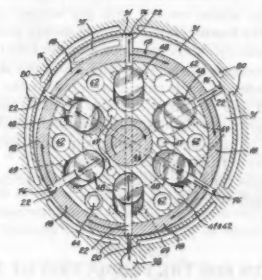
thereon press fit within said hub bore, bearing means supported between the inner surface of said open ended tubular extension and the outer surface of said pivot pin at the free end thereof to rotatably support said restraint member on the free end of the pivot pin, an extension on said rotatable restraint member piloted within said circular guide track to guidingly restrain deflection of said free end of said pivot pin to reduce wear on the tips of said vanes as they sweep across the inner surface of said housing.

3,954,358

COMPRESSOR

Michel Normandin, 1328 Nelles, Ste-Foy, Quebec, Canada

Filed Aug. 16, 1974, Ser. No. 498,215
Int. Cl.² F01C *21/00, 1/00;* **F04C** *17/00, 29/00*
U.S. Cl. 418—151 **13 Claims**



1. In a vane-type rotary fluid displacing machine
a housing having an interior profile of a first order of configuration with constant diametrical chord,
a rotor rotatably mounted in said housing and including a series of arc-shaped segments disposed in circular alignment in said housing and spaced to define therebetween a series of elongated radial openings,
a symmetrical system of unbalanced vanes slidably mounted in said openings and bearing at each extremity against said interior profile, said system including n vanes wherein n is an integer greater than 1, whereby said constant diametrical chord is equal to the length of said vanes, each of said vanes including a pair of blades disposed at 180° with respect to each other,

each said vane defining in said housing, between said interior profile and said segments, chambers of variable volume depending on the relative rotational position of each segment with respect to said housing profile, and

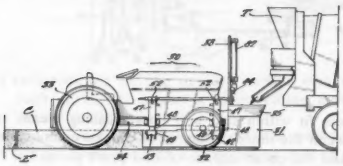
means mounted at opposite ends of said rotor associated with each blade of each individual vane and in line therewith for balancing the effect of centrifugal and inertial forces acting on said vanes.

3,954,359

APPARATUS FOR THE CONTINUOUS CASTING OF CONCRETE

Frank O. Larkin, York, Pa., assignor to William T. Shields, Camp Hill, Pa., a part interest

Filed May 10, 1974, Ser. No. 469,426
Int. Cl.² B28B *13/02*
U.S. Cl. 425—63 **4 Claims**



1. Apparatus for the continuous casting of concrete by the slip mold method comprising:

self propelled tractor means,

a support frame rigidly mounted on said tractor means so as to preclude relative movement therebetween,

a slip mold having top and side walls and an open bottom,

a hopper having front, rear and side walls at the front of said slip mold in communication with slip mold for supplying concrete to the slip mold, said slip mold being mounted beneath the tractor and extending in a direction longitudinally of the tractor with the hopper projecting upwardly from the slip mold in front of the tractor,

mounting means for said slip mold for adjustably mounting said slip mold to said tractor in a position extending lengthwise of the tractor with the hopper projecting in front of the tractor, said mounting means including a pair of hydraulic cylinders provided on each side of the tractor interconnecting the support frame and the slip mold with one cylinder of each pair connected to the front of the slip mold and the other cylinder of each pair connected to the rear of the slip mold, said hydraulic cylinders being operable to raise and lower said slip mold and hopper and tilt the same from side to side, and

control means for said hydraulic cylinders to control operation of said hydraulic cylinders.

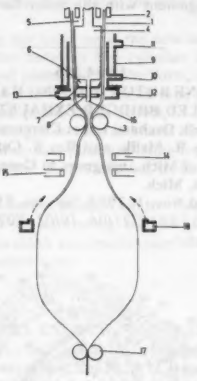
3,954,360

APPARATUS FOR THE PRODUCTION OF TUBULAR FILM

Derek Skilling, Dumfries, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 14, 1974, Ser. No. 497,512
Claims priority, application United Kingdom, Sept. 17, 1973, 43477/73
Int. Cl.² B29C *17/00*
U.S. Cl. 425—66 **7 Claims**

1. An apparatus for the production of an oriented tubular film of a thermoplastic polymeric material comprising an annular orifice for extrusion of a thermoplastic tube, a mandrel coaxial with, and of diameter less than, the extrusion orifice for cooling and sizing the tube, means for withdrawing the tube over the mandrel, means for stretching the tube including a distributor beyond the end of the mandrel remote from the orifice for introducing an inflating gas into the tube, and, between the mandrel and distributor, a cup seal for peripheral engagement with the internal surface of the tube, said



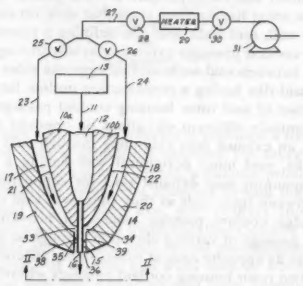
cup seal presenting a substantially concave surface to the mandrel.

3,954,361

MELT BLOWING APPARATUS WITH PARALLEL AIR STREAM FIBER ATTENUATION

Robert Edward Page, Davis, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed May 23, 1974, Ser. No. 472,524
Int. Cl.² D01D *5/00*
U.S. Cl. 425—72 S **7 Claims**



1. A mechanism for producing a plurality of elongate filaments of plastic material comprising in combination:

a die head having a plastic flow chamber therein for receiving a flow of heated plastic material with said die head being elongate transversely of the direction of plastic material flow;

a plurality of small parallel flow passages in the head leading from said head chamber for conducting plastic therefrom;

individual tubes extending parallel from each of said passages with an extruding discharge opening at their downstream end and receiving plastic material from said passages;

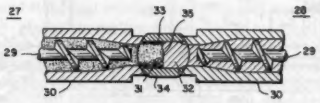
and first and second gas flow ducts positioned laterally outwardly respectively at each side of said elongate die head for receiving gas under pressure, said ducts having a downstream portion outwardly of said tubes and parallel thereto for discharging gas substantially parallel to the plastic flow from the tubes with the gas engaging the outer surface and attenuating the free plastic streams emitted from the discharge openings of the tubes;

said tubes being laterally spaced from each other so that gas in said downstream portion of said ducts encircles the tubes for 360° and flows axially surrounding the tubes encircling the streams for attenuating the streams completely around their outer surfaces.

3,954,362
TRANSFER MOLDING THERMOSETTING POLYMERIC MATERIAL

Donald Edward Boesch, Trenton, and Yusuf Taher Koita, Lawrenceville, both of N.J., assignors to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 446,887, Feb. 28, 1974, Pat. No. 3,911,075. This application June 27, 1975, Ser. No. 590,889
Int. Cl.² B29C 9/00; B29F 1/12
U.S. Cl. 425—130 **3 Claims**



1. Apparatus for forming a slug consisting of a first body of first material and a second body of second material, said first and second bodies of material contacting each other along an interface intermediate the two ends of said slug, said apparatus comprising:

a. a first extruder having an outlet end;

b. a second extruder having an outlet end;

c. said first and second extruders being arranged with their respective outlet ends facing each other;

d. said first and second extruders being adapted to extrude first and second materials, respectively, said first and second materials contacting each other along an interface;

e. means interposed between the outlet ends of said first and second extruders and adapted to simultaneously sever said first material and said second material from said first and second extruders, respectively, on both sides of said interface.

3,954,363
CONTROL CIRCUIT FOR PHONOGRAPH RECORD PRESSING DIE APPARATUS

Csaba K. Hunyar, Sunland, Calif., assignor to United Artists Music and Records Group, Inc., Los Angeles, Calif.

Filed May 8, 1974, Ser. No. 467,873
Int. Cl.² B29D 17/00
U.S. Cl. 425—157 **10 Claims**

1. In phonograph record pressing apparatus incorporating pressing die means movable between open and closed positions, flow control actuator and valve means to control flow of heating and cooling fluid to the die means, and other means including fluid responsive actuators and fluid pressure control valves to supply a plastic blank to the opened die means, to close the die means for pressing the blank into a record and thereafter to open the die means, to remove the record from the opened die means and to process the removed record, said valves being movable to control fluid pressure delivery to the actuators, said other means including solenoids connected with the valves to control said movement thereof, said apparatus being operable in automatic and manual control modes, the combination comprising

a. first circuit means to control said other means,

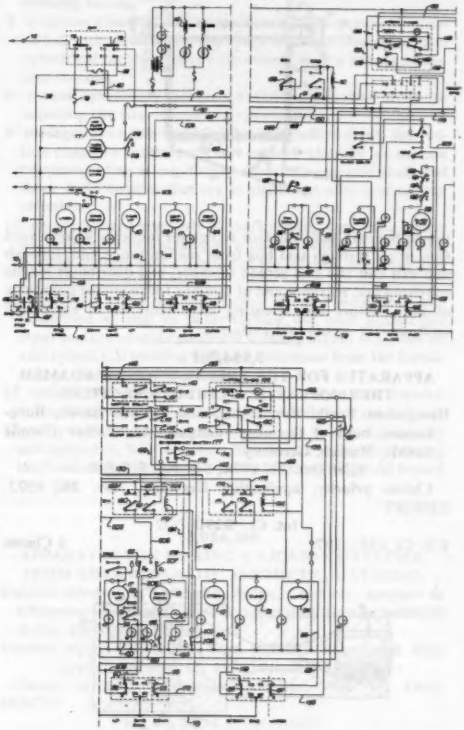
b. second circuit means to control said flow control actuator and valve means in timed relation to said opening and closing of the die means, and connected with said first circuit means to control same,

c. third circuit means including manually operable switches connected with the solenoids to control solenoid controlled valve movement thereby to control said plastic blank supply, said closing and opening of the die means and said removal and processing of the pressed record, and

d. mode control switch means to enable one or the other of said first and third circuit means,

e. there being indicator lights electrically connected with said solenoids to indicate energization thereof,

f. the second circuit means including a steam flow control and a water flow control, the water flow control being



connected to control said first circuit means, said second circuit means including switch means responsive to die means movement to prevent operation of the water flow control if the die means does not completely close, said second circuit means including delay means to delay initiation of water supply to the die means for a predetermined interval after cessation of steam supply to the die means, thereby to effect boosting of heating of the die means.

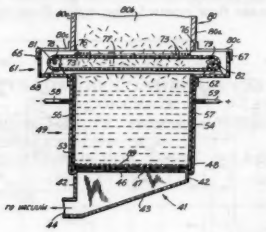
3,954,364
METHOD AND APPARATUS FOR FORMING BOARDS FROM PARTICLES

John W. Talbott, and James D. Logan, both of Moscow, Idaho, assignors to Berol Corporation, Danbury, Conn.

Division of Ser. No. 259,099, June 2, 1972, Pat. No. 3,843,756. This application July 18, 1974, Ser. No. 489,810
Int. Cl.² B29J 5/00
U.S. Cl. 425—174.8 E **9 Claims**

1. Apparatus for producing grain oriented particle board and the like from a mixture of elongated fibers and a bonding agent, comprising a box having parallel, vertically oriented side walls, end walls, an upper entrance portion, and a lower exit portion, a pair of parallel electrode means disposed adjacent said side walls of said box, said electrode means extending along at least a substantial vertical extent of said walls,

alternating current power source means connected with said electrode means for establishing throughout a vertically extended zone within said box a horizontally directed alternating current electric field, an air pervious collector screen member disposed beneath said exit end, negative pressure means positioned beneath said collector screen for inducing a downward flow of air through said box from said entrance end, through said exit end and said screen member, and distributor means overlying said entrance end of said box for receiving quantities of said mixture and releasing increments at an essentially uniform rate across said entrance.



3,954,365

APPARATUS FOR THE PREPARATION OF FOAMED THERMOPLASTIC EXTRUDED PROFILES

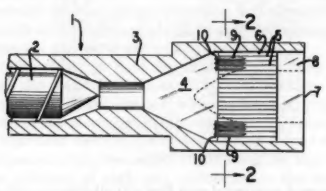
Hansjochen Barth, Emmerting, and Johann Bauer, Burghausen, both of Germany, assignors to Wacker Chemie GmbH, Munich, Germany

Filed Oct. 31, 1974, Ser. No. 519,540

Claims priority, application Germany, Nov. 28, 1973, 2359282

Int. Cl.² B29D 7/02

U.S. Cl. 425—197 5 Claims



1. An apparatus for the production of extruded profiles of foamed thermoplasts consisting essentially of an extruder having an extrusion helix and a form-giving extrusion head having a flow channel there-through, at least part of the length of said flow channel being divided by separating walls having a thickness of 0.2 to 3 mm arranged in the axial direction into individual channels of such a length and flow cross-section area that each individual channel has a nozzle coefficient k of form 0.1 to 2mm³, forming a throttle lattice and thorn-like pins positioned in some of said individual channels to reduce the flow cross-section area of said individual channels.

3,954,366

TWO-STAGE SINGLE SCREW EXTRUSION APPARATUS

Reuben T. Fields, 726 F. Peachtree Road, Claymont, Del. 19703

Filed Jan. 6, 1975, Ser. No. 538,755

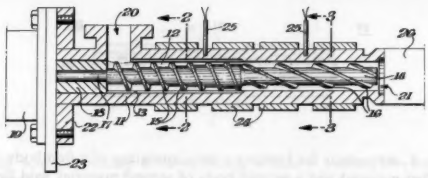
Int. Cl.² B29F 3/02

U.S. Cl. 425—208 9 Claims

1. An extrusion apparatus for extruding plastic resinous material comprising:

a. a tubular barrel member having a feed port near one end and a discharge port at the opposite end, said barrel member having an interior surface extending substantially throughout the length of the barrel between the feed port and the discharge port to define a substantially constant diameter bore therebetween, said bore being comprised of a first entrance high viscosity zone and a second lower viscosity mixing discharge zone, said first zone having longitudinal grooves along the interior surface;

b. a two-zoned screw member rotatably mounted within the bore of said barrel, said screw member having an effective length substantially equal to that of the bore of the barrel member and having a predetermined thread, hand, land, pitch, and diameter for each of said first entrance zone of the bore and the second discharge zone of the bore; the first zone of the screw has a close fit with the interior surface of the bore of the barrel member, the pitch of the thread is substantially constant and is less than the diameter of the screw and the thread of the



screw has a depth that decreases along the length of the screw to provide a compression ratio within the range of about 2 to 3.5 and; the second zone of the screw has a shaft and thread diameter that is substantially less than the diameter of the bore of the barrel, the screw in said second zone has a multiple lead thread with a pitch at least two times the diameter of the bore to provide substantial blowback for mixing and discharge of resinous material;

c. rotating means operatively associated with the screw member for rotating the screw member;

d. heating means operatively associated with the barrel member to maintain temperature of the resinous material within the bore at predetermined temperatures; and

e. an extrusion die operatively associated with the discharge port of the tubular barrel member.

3,954,367

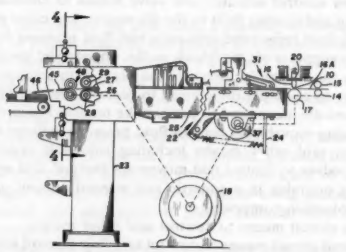
STACKING WHEELS WITH SUPERIMPOSED RETARDER ACTION

James R. Ambler, Seekonk, Mass., and Robert W. M. Hewitt, Bristol, R.I., assignors to G. T. Schjeldahl Company, Northfield, Minn.

Filed Sept. 16, 1974, Ser. No. 506,257

Int. Cl.² B29C 17/14

U.S. Cl. 425—289 4 Claims



1. In combination with a thermoplastic film converting machine having a working surface and a work station disposed therealong, means at the input end of said working surface for receiving a supply web of thermoplastic film to be treated, draw roll means for controllably moving said supply web from said supply to said work station, thermal treating means dis-

posed at said work station for intermittently sealing and severing said thermoplastic web at spaced locations along the length of said web to prepare thermoplastic film products therefrom, product conveyor means for removing thermoplastic film products from said thermal treating means and conveying said products to a product receiving station, and a product receiving station disposed at the output end of said conveyor means for receiving thermoplastic film products; corrugating wheels disposed along said conveyor means between said thermal treating means and said product receiving station for transferring said thermoplastic film products from said conveyor means to said product receiving station, said corrugating wheels comprising:

a. a first and second plurality of disc means disposed in spaced relationship along respective first and second generally parallelly disposed mounting shafts, with said first and second plurality of disc means being arranged in spaced staggered relationship along said mounting shafts, each of said mounting shafts being arranged for axial rotation and having drive means for imparting controlled rotation thereto, said first mounting shaft being disposed above the plane of said product conveyor means and said second shaft being disposed below said product conveyor plane, and with the peripheral edges of said first and second plurality of disc means overlapping to present a generally sinusoidal transverse profile;

b. said drive means being arranged to impart rotary motion to said mounting shafts in timed relationship to the movement of thermoplastic film products therethrough, with said drive means normally rotating said mounting shafts to drive said disc means at a peripheral rate generally equal to the linear speed of said conveyor means, and with speed control means arranged to intermittently and momentarily retard the rotational velocity of said mounting shafts and said disc means at a point in time generally coincidential with the passage of the trailing edge of each thermoplastic film product through said disc means and to thereafter restore said normal rotational velocity upon completion of passage of each thermoplastic film product through said disc means.

3,954,368

APPARATUS FOR CONTINUOUSLY FABRICATING CUSHIONING LAMINATED SHEETS

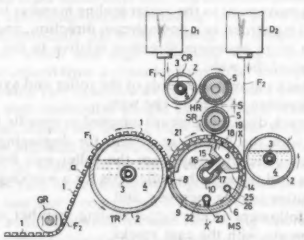
Satoshi Kawakami, 57-1254, Aza Horagai, Narumi-cho, Midori, Nagoya, Aichi, Japan

Filed Feb. 6, 1974, Ser. No. 440,055

Claims priority, application Japan, Feb. 7, 1973, 48-15400

Int. Cl.[2] B29D 7/10

U.S. Cl. 425—326 R **7 Claims**



1. Apparatus for continuously fabricating a cellular laminated material from first and second plastic films comprising

1. die members for continuously extruding said first and second films from a thermoplastic resin in a heat softened condition,

2. a cylindrical molding means that is rotatable about a first axis,

3. means for feeding said first film into circumferential contact with said cylindrical molding means,

4. a plurality of mold cavities on the periphery of said cylindrical molding means, said mold cavities being shaped to impart an embossed pattern to said first film,

5. a suction orifice in each of said mold cavities,

6. a hollow shaft extending centrally through said cylindrical molding means for rotatably supporting said cylindrical molding means,

7. a suction chamber and air suction means operatively associated with said hollow shaft and with the interior of said cylindrical molding means for maintaining a reduced pressure therein,

8. means operatively connected with said hollow shaft for adjusting the size of said suction chamber,

9. passageways extending between said hollow shaft, the suction chamber and said suction orifices whereby air suction communication is established therebetween said shaft and those mold cavities that are in alignment with said suction chamber,

10. means located interiorly of said cylindrical molding means for charging and discharging a liquid cooling medium into cooling contact with a portion of the interior surface of said cylindrical molding means,

11. a pressure roller means rotatable about a second axis and positioned so that its outer surface will bear against the outer surface of said cylindrical molding means at a point on said cylindrical molding means downstream from the formation of said embossed pattern,

12. means for feeding said second film between said cylindrical molding means and said pressure roller means, and

13. prior to the cylindrical molding means a roller for cooling said extruded, heat softened first film, a roller for heating said cooled first film, and a roller for stretching said heated first film.

3,954,369

APPARATUS FOR MAKING A LIQUID CONTAINER FROM THERMOPLASTIC SYNTHETIC MATERIAL

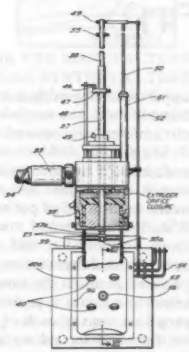
Kalman Körmendi, Karlsruhe, Baden, Germany, assignor to Elbatainer Kunststoff- und Verpackungs-GesellschaftmbH & Co., Ettlingen, Germany

Division of Ser. No. 72,389, Sept. 15, 1970, abandoned. This application Aug. 13, 1973, Ser. No. 387,854

Claims priority, application Germany, Sept. 16, 1969, 1946737

Int. Cl. B29d 23/03, 23/05

U.S. Cl. 425—326 B **6 Claims**



1. An apparatus for the production of a closed liquid container of thermoplastic material, comprising:

a forming tool comprising at least two separable mold parts defining a blow molding cavity conforming to the ultimate shape of said container in a closed condition of said tool;

an extruder head disposed above said forming tool for extruding a tubular parison of said material into said cavity in an open position of said mold parts;

at least one holding mandrel mounted adjacent said forming tool and displaceable axially into said cavity and provided with means for mounting an insert in said container reaching toward the lateral walls thereof and at at least two spaced apart locations;

means connected to said mandrel for axially displacing said mandrel relative to said forming tool and for shifting said mold part toward and away from said insert;

at least one holding claw mounted on at least one of said mold parts and projecting into said cavity for engagement with a juxtaposed portion of the parison wall and urging same against said insert, said claw being provided with a profile for shaping said parison wall to embrace at least partly an outer edge of said insert; and

means in said mold parts for mounting said claw to enable same to recede into a wall of said forming tool upon closing of said part around said parison.

3,954,370

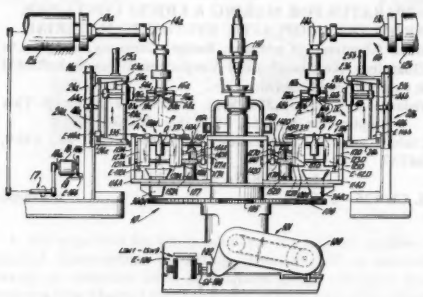
METHOD AND APPARATUS FOR MULTIPLE BLOW MOLDING WITH ROTARY TURNTABLE

Donald M. Pollock, Morristown, and Fulton W. Hallowell, Rumson, both of N.J., assignors to Consupak, Inc., Morristown, N.J.

Division of Ser. No. 368,249, June 8, 1973, Pat. No. 3,854,855. This application July 18, 1974, Ser. No. 489,517

Int. Cl.² B29D *23/03*

U.S. Cl. 425—326 B **19 Claims**



1. A blow molding apparatus comprising a rotary indexing turntable, means to rotatably index the turntable to a predetermined number of circumferentially spaced stations, said turntable having at least one partible mold mounted therewith for each of said circumferentially spaced stations, means to provide opened molds at at least at first and second of said spaced stations, first means to form a first parison operatively positioned at said first station and second means to form a second parison operatively positioned at said second station circumferentially spaced from said first station, said first and second parisons being formed at about the same time, means to position said first parison and means to position said second parison between the parted sections of each of the respective molds at the respective first and second stations, means to close said opened molds on said formed and positioned parisons at the respective first and second stations, first means and second means to introduce air under pressure to the interior of each of the respective parisons to expand the parisons to conform to the interior of the respective molds so as to form hollow objects therein, means to cool each of said objects during rotation of the turntable and circumferential transfer of the molds from at least said respective first and second stations, and means for removing the formed objects from the opened molds, at at least one of the said first and second stations so as to permit other formed parisons to be positioned therebetween.

3,954,371

APPARATUS FOR MAKING BAGS FROM SYNTHETIC PLASTIC FILM

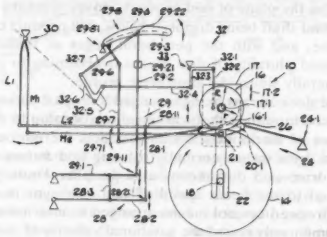
Thomas Gough Hutt, 936 Pretorius St., Arcadia, Pretoria, Transvaal, South Africa, and Robert Davis, 324 Lunsford Lane, Larkfield, Maidstone, Kent, England

Filed Dec. 13, 1974, Ser. No. 532,400

Claims priority, application South Africa, Dec. 21, 1973, 73/9660

Int. Cl.² B31B *1/16, 21/00*

U.S. Cl. 425—327 **23 Claims**



1. A bag-making machine which includes:

a. a cylindrical roller having means to rotate said roller about its axis, and having a plurality of circumferentially spaced longitudinal slots in its periphery;

b. feed means adapted to feed a continuous web of heat-sealable synthetic plastics material to the roller at a rate corresponding to the rate of rotation of the roller;

c. a cutter sealing member disposed transversely to the direction of feed of the web, the cutter sealing member having a blade adapted in operation to register with and to enter into a slot of the roller;

d. mating formations fast with the roller and the cutter sealing member respectively;

e. displacing means for cyclically displacing the cutter sealing member arcuately about and radially relative to the roller axis and in synchronism with the roller, the displacing means comprising a link system for imparting reciprocating movement to the cutter sealing member to perform a working stroke in a downstream direction, and a return stroke in an upstream direction relative to the direction of feed of the web;

f. cam tracks at opposite ends of the roller and extending in the direction of feed of the web;

g. cam track displacing means adapted to operate in sychronism with the link lever system for displacing the cam tracks cyclically away from the roller axis for a return stroke and towards the roller axis for a working stroke of the cutter sealing member; and

h. cam followers on the cutter sealing member adapted to co-operate with the cam tracks;

the mating formation for the roller including a toothed wheel fast and co-axial with the roller, the number of teeth of the wheel corresponding to the number of slots in the roller, and the mating formation for the cutter sealing member including at least one tooth adapted to mesh with the said toothed wheel, the mating formations being adapted to engage with each other at the start of a working stroke, and to move in unison with each other during the working stroke over an arc about the roller axis, and to disengage from each other at the

end of the working stroke, the mating formations being adapted to ensure, upon inter-engagement with each other, that the cutter blade registers accurately with and remains in registration with a slot in the roller surface during the period of the working stroke, during which period sealing and cutting of the film layers is taking place, the cutter sealing member being adapted in operation in following the cam tracks cyclically to move towards and away from the roller axis and to seal and to cut the film layers in a direction transverse to the direction of feed of the web, and after such sealing and cutting, to move clear of the web and to return to its initial position for a new cycle of operation.

3,954,372

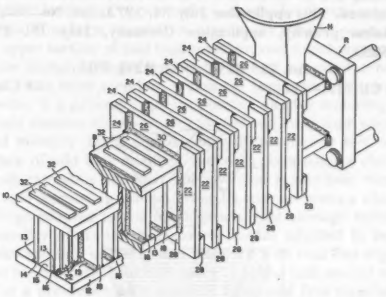
REINFORCED EXTRUDER FOR HIGH MOLECULAR WEIGHT POLYETHYLENE

Coyt E. Murray, Impact Plastics, Inc. P.O. Box 12427, Gastonia, N.C. 28052

Continuation-in-part of Ser. No. 613,321, Feb. 1, 1967, abandoned, and a continuation of Ser. No. 814,503, May 24, 1969, abandoned. This application Mar. 21, 1974, Ser. No. 453,204

Int. Cl.² B29D *23/04*

U.S. Cl. 425—378 R **4 Claims**



1. In an extruder for converting from a granular to a solid state high molecular weight polyethylene resin having a molecular weight of at least 1,000,000 and possessing an inherent characteristic of tremendous outward expansion when subjected to the requisite processing heat and requiring the application of carefully controlled heat to first coalesce the discrete resinous particles into an amorphous state and to then cool the amorphous mass uniformly, said extruder comprising a longitudinally extending barrel including two pairs of opposed parallel substantially flat walls defining an elongated passageway within which said high molecular weight polyethylene resin is processed from a granular form to an amorphous mass, a reciprocable ram operable at one end of said passageway to force the high molecular weight polyethylene resin into said passageway, means for feeding high molecular weight polyethylene resin into said one end of the passageway in advance of the ram in its withdrawn position, means for variably heating the walls of said barrel along its length to define, successively, from said one end a compression zone, a transsition zone and a cooling zone, said reciprocable ram being operable to advance successive charges of high molecular weight polyethylene resin from said one end of the extruder into the compression zone and through the successive transition and cooling zones and out the other end of the extruder, means reinforcing the walls defining at least the compression zone of the extruder, said means comprising a plurality of braces surrounding the barrel and spaced axially from each other along at least the compression zone of the barrel, and two opposed walls of the extruder are spaced inwardly from the outer edges of the other pair of opposed walls and a plurality of axially spaced inner braces extend into the space formed between one pair of said opposed walls and the outer of another opposed wall.

3,954,373

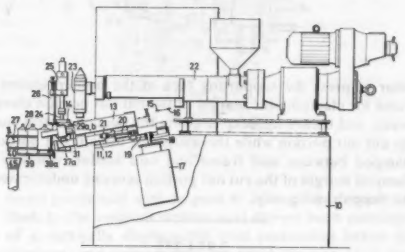
APPARATUS FOR THE MANUFACTURE OF HOLLOW BODIES

Heinz Rolniczak, Hennef, and Peter Klüsener, Bonn-Bad Godesberg, both of Germany, assignors to Kautex-Werke Reinold Hagen GmbH, Bonn-Holzlar, Germany

Filed Apr. 17, 1973, Ser. No. 351,989

Int. Cl.² B29C *1/00, 5/06*

U.S. Cl. 425—387 B **4 Claims**



1. Apparatus for the cyclical manufacture and transport of blow molded hollow bodies from thermoplastic material comprising hollow mold members, gripper means, both said hollow mold members and said gripper means being movable between an open and closed position, means mounting said hollow mold members and said gripper means for movement of said hollow mold members between a parison receiving station, and a mold releasing station simultaneous with movement of said gripper means between said releasing station and a transfer station, means to expand the parison to form a hollow body, means for moving the hollow mold members into an open position to release them from contact with the hollow body, a holder for supporting the hollow body after the hollow mold members are released, and means for moving said gripper means into a closed position to engage the hollow body for transport to the transfer station by said mounting means, both said moving means being independently connected to their respective hollow mold members and gripper means such that said hollow mold members and said gripper means are movable in the open position and in the closed position relative to each other through the action of the moving means only.

3,954,374

DEVICE FOR THE MANUFACTURE OF DEEP-DRAWN OBJECTS USING SYNTHETIC, THERMOPLASTIC FOILS

Fritz Wommelsdorf, and Werner Schmidt, both of Hamburg, Germany, assignors to Maschinenfabrik Rissen G.m.b.H., Hamburg, Germany

Division of Ser. No. 253,122, May 15, 1972, abandoned. This application July 17, 1974, Ser. No. 489,109

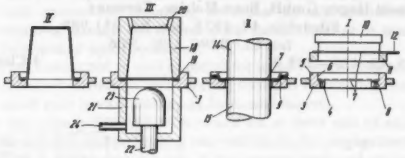
Claims priority, application Germany, May 14, 1971, 2123916

Int. Cl.² B24C *17/03*

U.S. Cl. 425—388 **8 Claims**

1. Apparatus for manufacturing deep drawn objects from cut out portions of a thermoplastic foil material of uniform thickness, the objects having a central deep drawn part and a uniform marginal edge projecting radially from the top thereof, said apparatus comprising a series of holders, a conveyor for conveying said holders through at least one heating station and a deep drawing station, each holder having an annular supporting face for supporting one side of the margin of one of said portions and means for maintaining the margin on the supporting face during conveying movement and at the

heating station, said means leaving free the side of the margin opposite to the supporting face, at least one pair of contact heating elements provided at the at least one heating station for pressing and heating the central part of the cut out portion between them, a mould provided at the deep drawing station and having a frame at its open end, said frame and said holder at the deep drawing station being movable relative to each



other to press the supporting face of the holder against the frame for clamping the margin of the cut out portion therebetween, and means for deep-drawing the heated central part of the cut out portion while the margin of the cut out portion is clamped between said frame and said holder, whereby the clamped margin of the cut out portion remains undeformed by the deep drawing step.

3,954,375

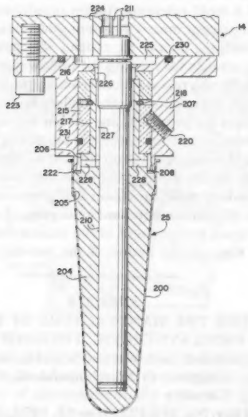
MANDREL AND PREFORM ASSEMBLY

Jerome A. Strzyzynski, Franklin Park, and Charles Richard Hallengren, Deerfield, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 409,511, Nov. 5, 1973. This application Jan. 20, 1975, Ser. No. 542,534

Int. Cl.² B29D *23/03*

U.S. Cl. 425—403 **7 Claims**



1. A mandrel assembly for heating and blowing a preform in which the preform is at ambient temperatures when it is received onto the mandrel assembly and in which the preform is formed of a thermoplastic material and comprises an annular rim portion and an elongated cone-shaped body portion extending from said rim portion to an opposite rounded closed end, said mandrel assembly having a first outer surface portion substantially complementary configured to the interior shape of said preform with one end being rounded and the other end being cylindrical, passageway means through said mandrel assembly to said cylindrical end of said first outer surface portion for drawing air from between said first outer surface portion and the interior of any preform mounted thereon, means in said mandrel assembly for conductively heating said outer surface portion to conductively heat any preform in contact therewith, said mandrel assembly further including a cylindrical holder portion in axial alignment with said first outer surface portion and spaced from said other end of said outer surface portion to receive the rim portion of a preform thereabout and to effect at least a substantial air seal with said rim portion of any preform mounted thereon, said cylindrical holder portion being thermally insulated from said means in said mandrel assembly for conductively heating said outer surface portion, and outer surface of said cylindrical holder portion hving a length sufficient to permit any preform mounted about said first outer surface portion with the rim portion thereof about said cylindrical holder portion to expand longitudinally further over the outer surface of said cylindrical holder portion responsive to the heating of said preform from said ambient temperatures to forming temperatures.

3,954,376

APPARATUS FOR MAKING MOLDED BODIES FROM LIGNO-CELLULOSE PARTICLES

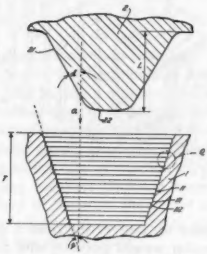
Edmund E. Munk, Oberstenfeld, Germany, assignor to Werzalit-Pressholzwerk J.F. Werz Jr. KG, Oberstenfeld, near Stuggart, Germany

Continuation of Ser. No. 225,099, Feb. 10, 1972, abandoned, which is a division of Ser. No. 101,028, Dec. 23, 1970, abandoned. This application July 24, 1973, Ser. No. 382,204

Claims priority, application Germany, July 15, 1970, 2035053

Int. Cl.² B29C *3/00;* B29J *5/02*

U.S. Cl. 425—412 **18 Claims**



1. An arrangement for making molded bodies from flowable mixtures which include particles and a binder, comprising a first die having a cavity adapted to receive a mixture of particles and binder, said cavity having an open side and being bounded at least in part by a bounding surface opposite said open side and by an exposed face extending from said bounding surface towards said open side and which has an end portion remote from said bounding surface; a second die receivable with clearance in said cavity through said open side and being movable in direction towards said bounding surface, said second die having a compressing surface for cooperation with said bounding surface in compressing said mixture, and a substantially smooth compressing face for cooperating with said exposed face in compressing said mixture in the clearance between said exposed face and said compressing face; and means for retaining the mixture in said clearance against displacement towards said bounding surface during the movement of said second die in said direction, comprising steps provided in said exposed face from at least the vicinity of said bounding surface to at least the vicinity of said end portion, each of said steps including a first face portion which extends in a direction from said bounding surface towards said open side and a second face portion facing towards said open side and inclined to said first face portion at an angle different than 90°, said exposed face being otherwise substantially free of discontinuities in the stepped part thereof.

3,954,377

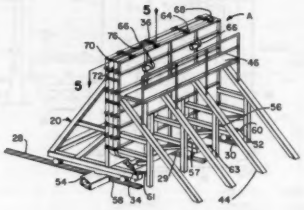
VERTICAL MOLD FOR MAKING TEXTURED CONCRETE PANELS

Ray John Scholz, and Thomas Patrick Fuller, both of Los Altos, Calif., assignors to Torres, Inc., Mountain View, Calif.

Division of Ser. No. 279,406, Aug. 10, 1972, Pat. No. 3,843,089. This application Sept. 12, 1974, Ser. No. 505,417

Int. Cl.² B28B *1/08, 7/06*

U.S. Cl. 425—432 **5 Claims**



1. An adjustable, reusable mold for forming concrete slabs comprising: a first concrete impervious form member; a concrete impervious base member provided with a plurality of slots and having an upper surface; means for fixedly supporting said first form member in a generally upright position on the upper surface of said base member, said fixedly supporting means including first engagement means: a second concrete impervious form member; means for supporting said second member in a generally upright position and for mounting said second member for movement toward and away from said first fixed member along a path generally parallel to said upper surface of said base member, said path comprising a plurality of rails extending into the respective slots in said base member and said supporting and mounting means comprises a wheeled carriage adapted to roll on said rails, said carriage including a plurality of second engagement means adapted to be extended through said slots and interlock with said first engagement means; means for releasably coupling said second member at a pre-determined distance from said first member on said base member; a pair of concrete impervious side members movable into closing relationship to the side opening defined by said first and second members; means for retaining said pair of side members in fluid-tight engagement with said first and second upright members and said base member; and resilient liners secured to and overlying said first and second form members to provide a textural pattern to said concrete slab.

3,954,378

DIE CASTING MACHINE WITH SEVERAL MOLDS

Roland Johansson, Bromolla, Sweden, assignor to Ifo AB, Bromolla, Sweden

Filed Dec. 17, 1974, Ser. No. 533,615

Claims priority, application Sweden, Dec. 17, 1973, 7316977; Dec. 17, 1973, 7316978

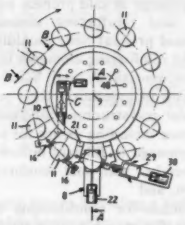
Int. Cl.² B28B *1/24*

U.S. Cl. 425—451 **5 Claims**

1. A die casting machine comprising a rotatable frame, a plurality of separable, bi-sectional flasks enclosing the molds for the objects to be cast arranged on the frame at equidistant arc intervals about the periphery of the frame, at least one section of each mold-enclosing flask being pivotal from a casting position to a removal position, reciprocating means for causing relative movement between the pivotal section and the other section of each flask, means for incrementally rotating the frame over a prescribed arcuate distance corresponding to the angular separation of the flasks to advance each flask to a common station where the cast objects are then removed, and means for locking the frame in position when a flask is brought to the removal station,

wherein the means for incrementally rotating the frame includes an arm swingable in the horizontal plane, and a gripping element on the arm mounted to reciprocate in a longitudinal direction of the arm and having formed thereon a rearward guide surface adjacent a groove oriented substantially transverse the direction of reciprocating movement,

and wherein the frame is a horizontal platform having a plurality of drivers, corresponding in number to the number of flasks, circularly located on the frame and operatively positioned with respect to advancing a respective flask to the removal station, said drivers each consisting of a vertically displaceable stud protruding below the platform and arranged to be lifted up one at a time through engagement with the rearward guide surface of the gripping element during a reciprocating return movement thereof until the driver stud is above the groove in the gripping element, whereupon the driver stud drops into the groove and is carried along by the gripping element during a reciprocating forward movement thereof to incrementally rotate the frame.



3,954,379

APPARATUS FOR CONTINUOUS MOLDING OF REINFORCED RESIN PROFILE MEMBERS

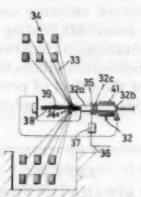
Otto Klocke, Hunxe-Bucholtwelmen, Germany, assignor to Grillo-Werke Aktiengesellschaft, Duisburg-Hamborn, Germany

Continuation-in-part of Ser. No. 210,827, Dec. 22, 1971, abandoned. This application June 21, 1974, Ser. No. 482,706

Claims priority, application Germany, Dec. 22, 1970, 2063169; May 3, 1971, 2121643

Int. Cl.² B22B *21/52, 21/74*

U.S. Cl. 425—505 **9 Claims**



1. An apparatus for the continuous molding of a structural profile member of predetermined constant cross-sectional shape and having embedded therein a plurality of continuous length, substantially parallel reinforcing elements selected from at least one member of the group consisting of fibrous rovings and fabric webs, said apparatus comprising in combination:

a. a longitudinally extending molding duct means defining a single molding passage with an inlet end and an outlet end, said passage, over substantially its entire length and including said inlet and outlet ends, having the predetermined cross-sectional shape of said cross-sectional shape of the profile member to be formed, said molding duct

means comprising a preheat zone adjacent said inlet end and a wetting zone downstream of said preheat zone;

b. means for continuously feeding a plurality of continuous length reinforcing elements selected from at least one member of the group consisting of fibrous rovings and fabric webs and having a heat softenable sizing material adhering thereto into said duct means at said inlet end, said feeding means including guide means for predeterminately positioning said elements with respect to each other and said molding passage as they are fed through said inlet end;

c. said molding passage at said preheat zone being adapted to compress said reinforcing elements into mutual contact, and said preheat zone including heating means for heating said reinforcing elements to cause said sizing material to become tacky and bond said compressed reinforcing elements together at their points of contact to form an irregular grid structure filled with hollow spaces;

d. said wetting zone including means for injecting resin into said molding passage to fill said hollow spaces and form said profile member with said reinforcing elements embedded therein; and

e. withdrawal means for continuously drawing the reinforced resin profile member from the outlet end of said molding duct means.

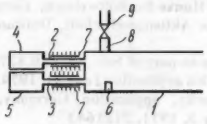
3,954,380
METHOD AND APPARATUS FOR INTERMITTENT COMBUSTION

Alexandr Alexandrovich Valaev, 1 Novokuzminskaya ulitsa 20, korpus 2, kv. 75; Dmitry Georgievich Zhimerin, ulitsa Corkogo, 9, kv. 51; Eduard Alexandrovich Mironov, Kutuzovsky prospekt, 35/30, kv. 138, and Vladimir Andreevich Popov, ulitsa Vavilova, 48, kv. 230, all of Moscow, U.S.S.R.

Continuation of Ser. No. 506,507, Sept. 16, 1974, abandoned, which is a continuation of Ser. No. 408,432, Oct. 23, 1973, abandoned. This application Apr. 16, 1975, Ser. No. 568,788

Int. Cl.[2] F23C *3/02*

U.S. Cl. 431—1 **8 Claims**



1. A method of intermittent detonation combustion of a fuel mixture in a combustion chamber comprising the steps of providing admission manifolds feeding a fuel and an oxidizer separately into the combustion chamber igniting fuel intermittently, cooling the combustion products forced into the admission manifolds under the effect of pressure rising for a short time in the combustion chamber and delivered into the combustion chamber.

3,954,381
METHOD OF AND APPARATUS FOR INCINERATING AN AQUEOUS SOLUTION CONTAINING NITRO COMPOUNDS

Paul Marécaux, Ville d'Avray, France, assignor to Societe Pour l'Equipement des Industries Chimiques Speichim, Paris, France

Filed Feb. 25, 1974, Ser. No. 445,133

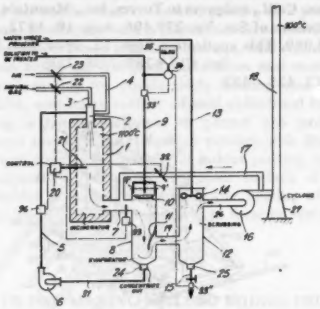
Claims priority, application France, Mar. 2, 1973, 73.07503

Int. Cl.[2] F23G *7/00*

U.S. Cl. 431—2 **6 Claims**

1. A method of incinerating an aqueous solution containing a toxic nitro compound solute which comprises the following steps:

a. incinerating by combustion with a fuel-air mixture a concentrated liquid containing the toxic solute at a temperature of substantially 1000 to 1200°C to form a hot, dry, detoxified vapor from said liquid;



b. passing said hot, dry, detoxified vapor into heat exchange with a trickle of said aqueous solution to concentrate said solution and form more of said liquid while carrying away water by evaporation; and

c. feeding said liquid from step (b) to step (a).

3,954,382
COMBUSTION APPARATUS AND METHOD

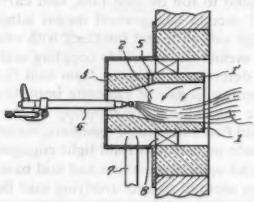
Yasuo Hirose, 4-8-9, Kugahara, Ota, Tokyo, Japan

Filed Dec. 11, 1974, Ser. No. 531,477

Claims priority, application Japan, Apr. 8, 1974, 49-38784

Int. Cl.[2] F23M *9/00*

U.S. Cl. 431—9 **17 Claims**



1. Combustion apparatus which performs combustion reducing NOx generating rate and producing flat flame comprising; a burner tile structure which is of rectangular section, multiple high pressure type burners secured on a cover plate closing the front end of the burner tile structure, means for forming a flat fuel stream along one major wall of the burner tile, the means including a series of air inlet holes or an air inlet slit provided in the opposite major wall of the burner tile structure so as to stabilize the direction of deflection of high velocity fuel stream according to Coanda Effect towards the opposite burner tile wall, combustion air passages and jets along the outside of the burner tile major walls.

2. The method of combustion comprising:

injecting fuel from a nozzle through a cover plate,

deflecting the injected fuel toward a long wall, forming a flat fuel screen

drawing high temperature combustion gas from a combustion space toward the injected fuel,

mixing the combustion gas with the injected fuel,

flowing mixed combustion gases and injected fuel toward the combustion space from a space near the long wall,

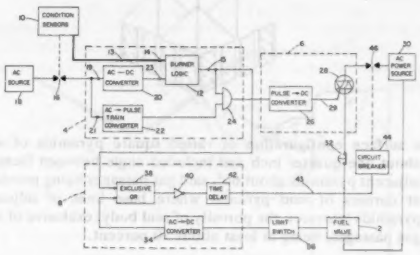
adding oxygen to the fuel and combustion gas mixture, and

igniting the mixture in the combustion space.

3,954,383
BURNER CONTROL SYSTEM

Jack A. Bryant, Boston, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed Sept. 17, 1973, Ser. No. 397,640
Int. Cl.² F23N *5/24*
U.S. Cl. 431—24 **14 Claims**



1. In a burner control system having a fuel control device, and a sensor adapted to sense a condition in the system and to provide a signal denoting said condition, the improvement comprising a fail-safe, self-checking system for controlling said fuel control device, comprising:

a control circuit, said control circuit having an input terminal for reception of said condition signal, logic for processing said condition signal, an output terminal, and solid state switching means connected in circuit between said input terminal and said output terminal, said control circuit adapted to produce a control signal at said output terminal in response to the condition signal at said input terminal,

means for cyclically alternating the state of said switching means, and thereby providing a cyclically alternating level of the control signal at said output terminal in response to said condition signal,

an actuating circuit connected between said output terminal and the actuator of said fuel control device, and adapted to provide an actuating signal for said fuel control device in response to a cyclically alternating control signal level at said output terminal, but not otherwise,

a comparison circuit to compare the output signal of said condition signal processing logic with a signal denoting the condition of said fuel control device, and

means actuated by said comparison circuit when the said compared signals are incompatible to override said actuating signal for said fuel control device.

3,954,384
BURNER SYSTEM

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 20, 1974, Ser. No. 444,198
Int. Cl.² F23Q *9/08*
U.S. Cl. 431—47 **8 Claims**

1. A burner system comprising

a main burner;

a pilot burner disposed in igniting proximity to the main burner;

first and second conduits to the respective main and pilot burners;

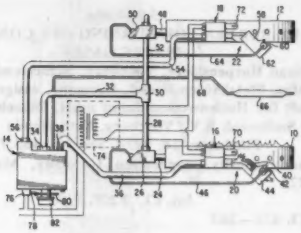
an electric igniter disposed in igniting proximity to the pilot burner;

means for controlling fuel flow to both the first and second conduits;

said controlling means including switch means for energizing the electric igniter when fuel is supplied to the first and second conduits;

valve means interposed in the first conduit between the controlling means and the main burner;

flame sensing means for opening the valve means in the presence of a flame from the pilot burner and for closing the valve means in the absence of a flame from the pilot burner;



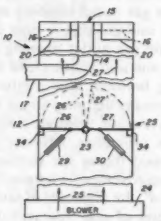
said flame sensing means including a bulb adjacent the pilot burner, an adsorbent carbonaceous material disposed in the bulb and a charge of gas in the bulb; and

said adsorbent carbonaceous material being formed from a synthetic polymer selected from the group consisting of polyvinylidene chloride and polyvinylidene fluoride by removing the hydrogen and halogen components leaving a porous structure with cavities of sufficient size to receive and adsorb the gas.

3,954,385
AIR POWERED SMOKELESS FLARE

Robert D. Reed; Roger K. Noble, and Robert E. Schwartz, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Feb. 24, 1975, Ser. No. 552,423
Int. Cl.² F23D *15/00*
U.S. Cl. 431—202 **4 Claims**



1. In an air powered smokeless flare burner system, comprising:

a. a cylindrical combustion air conduit;

b. means to provide combustion air at selected velocity into a first end of said conduit;

c. fuel burner means at the second end of said conduit, said burner means comprising a gas supply pipe and a plurality of equally spaced radial spider arms in a transverse plane, and a plurality of gas ports in each of said spider arms;

the improvements comprising:

d. a plurality of baffles, one between each pair of spider arms, said baffles constructed with a triangular base in a transverse plane, and two walls respectively parallel to said adjacent pair of spider arms, said walls attached to the cylindrical wall of said conduit; and

e. at least one opening through the wall of said conduit into the interior of each of said baffles;

whereby when combustion air is supplied to said first end of said conduit, it will flow along said conduit and into the spaces

between said baffles and said spider arms, at high velocity, causing turbulent mixing with the gas issuing from the ports in said spider arms, and inducing a flow of outside air through said openings in the wall of said conduit, into said baffles and out of the open end of said baffles, thus inhibiting the accumulation of soot on said baffles.

3,954,386

FLARE BURNER FOR BURNING OFF COMBUSTIBLE WASTE GASES

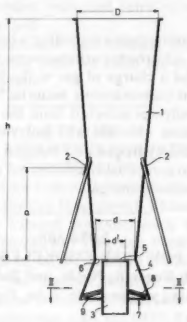
Christiaan Harpenslager, Voorburg, Netherlands, and Ulrich Ruhfus, Metzkausen-Hassel, Germany, assignors to Gesellschaft fur Huttenwerksanlagen mbH, Dusseldorf, Germany and Smitsvonk B.V., Voorburg, Netherlands

Filed Apr. 24, 1974, Ser. No. 463,769

Claims priority, application Germany, May 18, 1973, 2325225

Int. Cl.² F23G *9/00*

U.S. Cl. 431—285 **5 Claims**



1. In a flare burner for burning combustible waste gases comprising a venturi burner tube including means defining a throat in said venturi tube, a waste gas supply pipe including means defining a gas outlet opening at one end of said pipe, means mounting said gas supply pipe coaxially with said venturi tube with said gas outlet opening located at said venturi throat, said pipe and said venturi tube being sized to define an annular opening between said venturi throat and said gas outlet opening, means defining an air intake into said venturi tube for introducing air through said annular opening, and pilot burner jets projecting laterally into said venturi tube downstream of said throat for burning combustion maintenance gas, the improvement wherein the diameter of said gas outlet opening is d', the diameter of said venturi throat is d, the maximum diameter of said venturi tube downstream of said throat is D, the length of said venturi tube from said throat to the point of said maximum diameter is h, and the distance from said throat to the points of entry of said pilot jets into said venturi tube is a, and wherein the ratios of said dimensions $d' : d$, D, h and a is within the range 1: from 1.2 to 3, from 2 to 6, from 4 to 20 and from 3 to 15 respectively.

3,954,387

BURNERS

Charles Frank Cooper, Stourport-on-Severn, England, assignor to J. Tennant & Sons (Warrington) Limited, Warrington, England

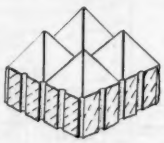
Continuation-in-part of Ser. No. 367,377, June 6, 1973, abandoned. This application July 25, 1974, Ser. No. 491,782

Claims priority, application United Kingdom, June 8, 1972, 26810/72

Int. Cl.² F23D *13/12*

U.S. Cl. 431—328 **2 Claims**

1. A radiant having a high heat output and high thermal shock resistance comprising a body having an open high porosity structure of bonded refractory ceramic fiber, the continuous service temperature of fiber and bonding agent of said body being at least about 1000°C, said body having gas passages therethrough through which a combustible gas mixture can be passed for combustion at the surface of the radiant and



a surface configuration of raised square pyramids of side about one quarter inch and included angle between faces of adjacent pyramids about 60°, said gas passages being provided at corners of said pyramid where base lines of adjacent pyramids intersect, the porosity of said body, exclusive of said gas passages, being at least about 70 percent.

3,954,388

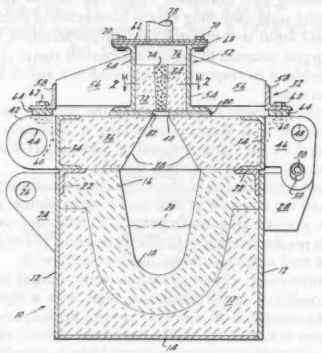
GAS BURNER AND FURNACE

Kornelius Hildebrand, 1523 E. Jefferson, Park Crest Apts., Apt. 416, Detroit, Mich. 48207

Filed Dec. 6, 1974, Ser. No. 530,416

Int. Cl.² F23D *13/14*

U.S. Cl. 431—329 **18 Claims**

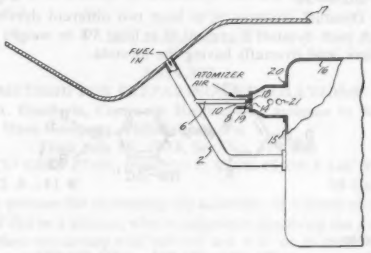


1. A burner comprising: housing means defining a substantially rigid enclosure and including wall means terminating in a common plane to define an open end to said enclosure, the opposite end of said enclosure being closed; an elongated strip of porous refractory material disposed in said enclosure, said strip of refractory material having an elongated generally flat hot face lying generally in said common plane, a cold face disposed on the opposite side of said strip from said hot face, and side faces of said strip disposed therebetween, said strip being wholly spaced from said wall means, said strip having a plurality of fuel flow passages extending therethrough from said cold face to said hot face, said hot and cold faces being spaced apart a distance greater than the width of said hot face; a body of heat insulating material disposed between said side faces of said strip and said wall means, said body of insulating material being relatively light in weight and filling the entirety of the space between said strip and said wall means, one surface of said body of insulating material lying generally in said common plane and the opposite surface of said body being at least in part spaced from said opposite end of said enclosure to define a plenum; and inlet means having a flow passageway for communicating a gaseous fuel to said plenum.

3,954,389
TORCH IGNITER

Eugene J. Szetela, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,316
Int. Cl.² F23D 11/38
U.S. Cl. 431—353 11 Claims



5. An igniter for attachment to a main burner of a gas turbine engine, including:

an air chamber having an air inlet and an elongated air discharge outlet passage;

a fuel tube extending through said air chamber and into said passage, said tube at least near to the passage and in said passage being smaller in diameter than said passage to provide a clearance for air flow around said tube; and

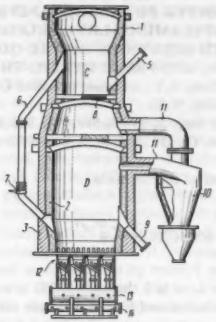
a helical member around and in contact with the portion of said tube near to and in said outlet passage and leaving an unobstructed space between said member and the wall of the outlet passage, the air closest to the tube being given a swirl by said helical member so that when it meets the fuel at the discharge end of the tube good mixing of the fuel with the air will occur within the cylinder of less rapidly swirling air discharging from the unobstructed air passage close to the periphery of said tube.

3,954,390
METHOD FOR PRODUCING AGGREGATE USED IN HARDENING COMPOSITIONS, PREDOMINANTLY CONCRETES, A FLUIDIZED-BED KILN FOR CALCINING MINERAL STOCK BY MEANS OF SAME METHOD, AND AN AGGREGATE PRODUCED BY SAME METHOD

Alizakir Alikhady Ogly Akhundov, ulitsa Shkolnaya, 8, kv. 8, Moskovskaya oblast, poselok Kraskovo; Nikolai Borisovich Kondukov, prospekt Vernadskogo, 9/10, kv. 343, Moscow; Kharlampy Sergeevich Vorobiev, ulitsa Zelenaya, 20, kv. 45, Ljubertsky Moskovskoi oblasti; Valentin Matveevich Dementiev, ulitsa Postysheva, 35, kv. 47, Donetsk; Boris Solomonovich Farber, ulitsa Novovokzalnaya, 12, kv. 7, Kuibyshev; Alexei Alexandrovich Zelenov, ulitsa K. Marxa, 117/14, kv. 17; Vladimir Alexandrovich Logvinov, ulitsa K. Marxa, 117/8, kv. 4, both of Moskovskaya oblast, poselok Kraskovo; Anna Ilinichna Polinkovskaya, 2 Schemilovsky pereulok, 8/10, korpus A, kv. 15, and Galina Alexandrovna Petrikhina, ulitsa Gorkogo, 41, kv. 136, both of Moscow, all of U.S.S.R.

Filed June 28, 1974, Ser. No. 484,234
Int. Cl.² F27B 15/10
U.S. Cl. 432—14 6 Claims

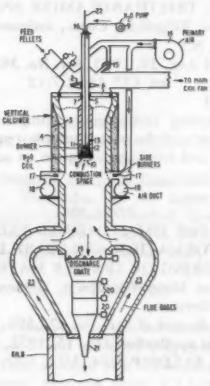
1. A method for producing aggregates for hardening compositions, predominantly concretes, which comprises calcining mineral stock in a fluidized bed by introducing gaseous fuel and air into said bed at the bottom thereof in separate rising jets uniformly distributed over the cross section of said bed, with the outflow of either said gaseous fuel or said air being directed upwardly at an angle to the vertical, and burning said gaseous fuel directly in said bed of the material being processed.



3,954,391
PROCESS FOR ENDOTHERMIC HEAT TREATMENT OF MATERIALS

Steven Gottlieb, East Hawthorn, Australia, assignor to Gorresens Inc., Chicago, Ill.

Filed Sept. 23, 1974, Ser. No. 508,430
Int. Cl.² F27B 15/00
U.S. Cl. 432—14 5 Claims



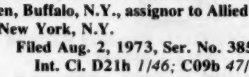
1. A process for the heat treatment of a material capable of undergoing an endothermic reaction and capable of being shaped in the form of pellets, comprising: providing said material in the form of shaped pellets; feeding said pellets downwardly through a vertical calciner; heating said pellets by drawing a flow of heated flue gases through the interstices, voids and narrow channels between said pellets in the vertical calciner to induce high velocity turbulent gas flow over and through the pellets in said calciner, said heated gas being provided from a short rotary kiln; supplying additional heat to the pellets in said calciner by directing said additional heat countercurrently in said calciner to said flow of said flue gases, said additional heat providing substantially complete calcination without substantial sintering of said material in said pellets; and directing the resulting calcined material still in pellet form into said kiln from which said heating flue gases are drawn.

3,954,392
COPPER PHTHALOCYANINE N-DI-N-BUTYLAMINOALKYL SULFONAMIDE, QUATERNIZED SOLUTIONS OF THE QUATERNARY COMPOUND, AND PAPER DYEING THEREWITH

Chi K. Dien, Buffalo, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

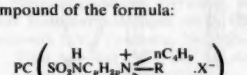
Filed Aug. 2, 1973, Ser. No. 385,016
Int. Cl. D21h *1/46;* **C09b** *47/04*
U.S. Cl. 8—7 **9 Claims**

1. A compound of the formula:



wherein *p* is 2 or 3, *m* is 1 through 5, PC is a phthalocyanine radical, X^- is an anion and R is H or lower alkyl of 1 through 4 carbon atoms.

4. A process for dyeing paper comprising contacting the paper with an aqueous solution of a compound of the formula:



wherein *p* is 2 or 3, *m* is 1 through 5, PC is a phthalocyanine radical, X^- is an anion and R is H or lower alkyl of 1 through 4 carbon atoms.

3,954,393
HAIR DYEING COMPOSITION CONTAINING BISMUTH CITRATE, TRIETHANOLAMINE AND SULFUR

Herbert Lapidus, Ridgefield, Conn., assignor to Combe, Inc., White Plains, N.Y.

Filed Aug. 29, 1973, Ser. No. 392,529
Int. Cl.² A61R *7/13*
U.S. Cl. 8—10.1 **3 Claims**

1. A hair dyeing composition comprising an effective amount of sulfur and the water soluble reaction product of bismuth citrate and triethanolamine in an aqueous vehicle.

3,954,394
METHOD FOR THE COMBINED PRECLEANING TEXTURE FORMATION AND STABILIZATION AND COLORING OF TEXTILE MATERIALS

Christian August Meier-Windhorst, Heidenkampsweg 66, 2 Hamburg 1, Germany

Continuation-in-part of Ser. No. 272,596, July 17, 1972, abandoned. This application Jan. 15, 1975, Ser. No. 541,294
Int. Cl.² D06P *3/24, 3/52, 3/82, 7/00*
U.S. Cl. 8—17 **1 Claim**

1. Process for the dyeing and finishing of webs of textured synthetic fibers, comprising the steps of:

a. heating said textile web to a temperature between about 100°C and about 130°C;

b. introducing said heated web into a separately heated dye bath maintained at a temperature between about 100°C and 130°C;

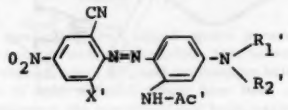
c. moving the web and dye solution in the same direction and at substantially the same speed whereby a substantially constant amount of dye liquid is applied to each unit length of web, the web floating in the liquid, the weight ratio of liquid to web being in the range of about 10:1 to about 50:1, until substantially all the dye particles have been absorbed from the bath by the web, the web being in a substantially tension-free state and being subjected, during the passage of dye onto the web, to intensive movement for removal of any spinning and treating assistants present in the web while simultaneously being subjected to structure and swelling development.

3,954,395
MIXTURES OF DYESTUFFS

Klaus Leverenz, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 13, 1973, Ser. No. 378,810
Claims priority, application Germany, July 13, 1972, 2234465
Int. Cl.² C09B *27/00, 45/48;* **D06P** *1/00, 3/00*
U.S. Cl. 8—26 **4 Claims**

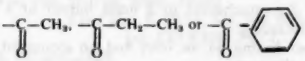
1. Dyestuff mixtures of at least two different dyestuffs in which each dyestuff is present in at least 5% by weight of the mixture, said dyestuffs having the formula



wherein

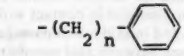
X′ represents CN, NO_2, SO_2CH_3 or $SO_2CH_2CH_3$,

Ac′ represents



R_1′ represents a C_2–C_4-alkyl radical,

R_2′ represents a C_1–C_4-alkyl radical or the



group and

n represents 0, 1 or 2

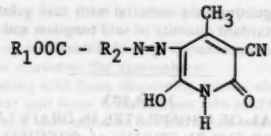
and the components of the mixture differ in at least one of the substituents R_1′ or R_2′.

3,954,396
DYEING SYNTHETIC MATERIALS WITH A DODECYL BENZOICACID ESTER-AZO-(3-CYANO-4-METHYL-6-HYDROXY-2-PYRIDONE)

Joachim Ribka, Offenbach, Main, and Ernst Heinrich, Frankfurt am Main-Fechenheim, both of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Division of Ser. No. 413,495, Nov. 7, 1973, abandoned, which is a continuation of Ser. No. 290,550, Sept. 20, 1972, abandoned. This application May 6, 1974, Ser. No. 467,077
Claims priority, application Germany, Sept. 24, 1971, 2147759
Int. Cl.² C09B *27/00*
U.S. Cl. 8—41 A **2 Claims**

1. In the process of dyeing and printing synthetic materials selected from the class consisting of polyolefins, polyvinyl compounds, polyacrylonitrile, cellulose-2 ½ acetate, cellulose triacetate and polyester materials wherein an aqueous dyestuff suspension is applied to the synthetic material and the synthetic material is steamed in the presence of a carrier between 80° to 110°C. or in the absence of a carrier between 110° to 140°C. or according to the thermofixing process at 180° to 230°C., the improvement wherein a monoazo dyestuff of the formula



wherein R_1 is n-decyl or n-dodecyl and R_2 is phenylene, is employed.

3,954,397
METHOD FOR PREPARING DYE SOLUTIONS

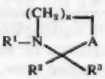
Fred A. Desiderio, Cornwells Heights, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed July 16, 1973, Ser. No. 379,530

Int. Cl.² C09B *27/00;* **D06P** *3/12;* **C09B** *45/00;* **C14C** *9/00*

U.S. Cl. 8—41 R **18 Claims**

1. A process for increasing the solubility of a metal chelate or acid dye in a solvent, which comprises dissolving the dye in a solution containing said solvent and a 5- or 6- membered heterocyclic tertiary amine, said solvents being selected from ketones, esters, ethers, aliphatic hydrocarbons, aromatic hydrocarbons, an excess of said tertiary amine or mixtures thereof and said tertiary amine having the following structural formula:



wherein A is oxy or thio, R^1 is an organic radical, R^2 is hydrogen or alkyl and R^3 is hydrogen, phenyl, benzyl, or alkyl or R^2 and R^3 may be joined together with the carbon atom to which they are attached to form a 5- or 6- membered hydrocarbyl ring and *n* is an integer having a value of 1–2.

3,954,398
POLYESTER FIBERS DYED WITH A DISAZO DISPERSE DYESTUFF

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

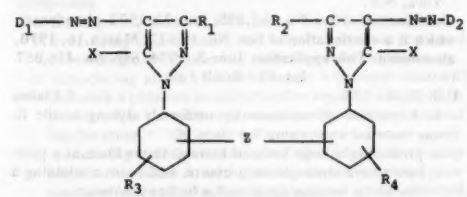
Continuation-in-part of Ser. No. 191,535, Oct. 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 816,394, April 15, 1969, abandoned. This application Oct. 29, 1973, Ser. No. 410,746

Claims priority, application Switzerland, Apr. 25, 1968, 6112/68

Int. Cl.² C09B *33/12;* **D06P** *3/54*

U.S. Cl. 8—41 C **4 Claims**

1. A polyester fiber dyed with a disazo disperse dyestuff free from $—SO_3H$ groups imparting solubility in water of the formula



in which

X represents hydroxyl or $—NH_2$, R_1 and R_2 each represents hydrogen, phenyl, C_1-C_2-alkyl, C_1-C_2-alkoxy, and when X = OH, also C_1-C_2-alkoxycarbonyl or $—CONH_2$,

Z represents —O—, —S—, —NH— cyclohexylidene, C_1-C_2-alkylene, —O—(C_1-C_2-alkylene)—O—, and

R_3 and R_4 each represent hydrogen, C_1-C_2-alkyl, C_1-C_2-alkoxy or chlorine, and

D_1 and D_2 are each a radical of a diazo component selected from the group consisting of thiazolyl which is unsubstituted or substituted by nitro, methylsulphonyl, cyano, methyl, phenyl, chlorophenyl or nitrophenyl; pyridinyl or the N-methyl (methylsulfate) quaternary salt thereof; quinolinyl; pyrazolyl which is unsubstituted or substituted by phenyl, methoxyphenyl, cyano or nitrophenyl; indazolyl; 1,2,4-triazolyl which is unsubstituted or substituted by methyl, ethyl, phenyl or benzyl; benzthiazolyl which is unsubstituted or substituted by methyl, methoxy, ethoxy, chloro, cyano, thiacyanogen, nitro, carbethoxy, methylsulphonyl, or the N-methyl (methylsulfate) quaternary salt thereof; 1,3,4-thiadiazolyl which is unsubstituted or substituted by phenyl; 1,3,5-thiadiazolyl which is unsubstituted or substituted by methyl or phenyl; thienyl substituted by nitro or methylsulphonyl; isothiazolyl substituted by methyl; and phthalimidyl.

3,954,399
PROCESS FOR DYEING NITROGEN-CONTAINING FIBERS

Yoshio Nemoto, Nagoya; Hiroyuki Funahashi, Komaki, and Takeo Miyake, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

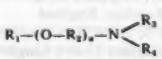
Filed Mar. 26, 1973, Ser. No. 345,064

Claims priority, application Japan, Mar. 28, 1972, 47-31461

Int. Cl.² D06P *5/06*

U.S. Cl. 8—54 **10 Claims**

1. A process for dyeing a nitrogen-containing fiber selected from wool, silk, nylon and modified polyesters, which comprises dyeing the fiber in a dye bath containing a halogenated hydrocarbon solvent selected from 1,1,1-trichloroethane, trichloroethylene and perchloroethylene and a dye complex of an anionic dye selected from azo, anthraquinone, triphenylmethane and phthalocyanine dyes which are water-soluble and contain at least one radical selected from ionic and polar radicals with an amine of the formula:



wherein R_1 represents a saturated or unsaturated hydrocarbon residue having 8 to 22 carbon atoms, R_2 represents a saturated or unsaturated divalent hydrocarbon residue having 2 to 6 carbon atoms, said hydrocarbon residue for R_1 and R_2 may be of a straight or branched chain, *n* represents an integer of 1 to 4, and each member of R_2 may be the same or different when *n* is 2 or more, R_3 and R_4 each represent a hydrogen atom, a lower alkyl or hydroxyalkyl group having 1 to 3 carbon atoms, and R_3 and R_4 may be the same or different.

3,954,400

PHOSPHORUS, NITROGEN, BROMIN CONTAINING POLYMERS AND PROCESS FOR PRODUCING FLAME RETARDANT TEXTILES

Wilson A. Reeves, Metairie; Darrell J. Donaldson; Donald J. Daigle, New Orleans, all of La.; George L. Drake, Jr., both of Metairie, and John V. Beninate, Gretna, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 265,862, June 23, 1972, Pat. No. 3,915,915, which is a continuation of Ser. No. 141,357, May 7, 1971, abandoned. This application Aug. 22, 1974, Ser. No. 499,810

Int. Cl.[2] C08G *51/24*; D06M *13/32*, *13/38*

U.S. Cl. 8—116 P 1 Claim

1. A process for imparting flame retardance to cellulosic textiles, comprising:

a. impregnating a cellulosic textile with a chemical formulation containing a quantity of tris(hydroxymethyl)phosphine cyanamide 2:1 adduct with sufficient quantity of an organic containing compound selected from the group consisting of polyvinyl bromide, brominated triallyl phosphate, and tris(2,3 dibromopropyl)phosphate to yield an adduct to brominated substance ratio of about 1 part by weight to 8 parts by weight,

b. drying the wet impregnated textile at about from 60°C to 125°C for about from 2 to 15 minutes, and

c. curing the dried textile at about from 125°C to 170°C for about from 2 to 15 minutes.

3,954,401

AGENT FOR THE TREATMENT OF CELLULOSIC FIBER MATERIALS AND PROCESS

Alfred Kling, Ladenburg, and Viktor Specht, Dossenheim, both of Germany, assignors to Benckiser-Knapsack GmbH, Ladenburg (Neckar), Germany

Division of Ser. No. 123,903, March 12, 1971, Pat. No. 3,833,517. This application Dec. 5, 1973, Ser. No. 421,805

Claims priority, application Germany, Mar. 14, 1970, 2012171

Int. Cl.[2] D06M *1/02*

U.S. Cl. 8—127 17 Claims

1. In a process for treating native cellulose fiber material to remove natural fatty, collenchymatous, pectin and lignin substances as well as residues of seed coats and oily contaminations due to spinning and weaving, comprising treating said fiber material at an elevated temperature of between about 90° and 140°C. with a strongly alkaline aqueous bath containing between about 5 and 10 g./l. of alkali metal hydroxide, the improvement which comprises said alkaline bath containing a phosphonic acid compound selected from the group consisting of an amino alkylene phosphonic acid, a 1-hydroxy lower alkane-1,1-diphosphonic acid alkali metal salts thereof and mixtures thereof.

3,954,402

TEXTILE TREATMENT

Ladislav Benisek, Ilkley, England, assignor to I.W.S. Nominee Company Limited, London, England

Filed May 3, 1974, Ser. No. 466,916

Claims priority, application United Kingdom, May 15, 1973, 23119/73

Int. Cl.[2] D06M *3/02*

U.S. Cl. 8—128 R 8 Claims

1. A process of improving the flame resistance of keratinous textile material comprising the steps of:

preparing a solution containing an anionic complex of tungsten and at least one anionic complex of titanium or zirconium said complexing agent selected from the group consisting of fluro, carboxylato and hydroxycarboxylato groups and having a pH below 3.5;

and impregnating said material with said solution until a flame retardant quantity of said tungsten and titanium or zirconium is taken up by said material.

3,954,403

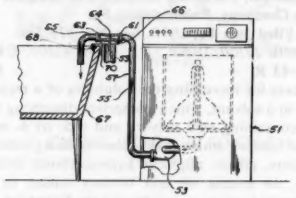
REMOVAL OF PHOSPHATES IN DRAIN LINE OF LAUNDRY TUB BY CHEMICAL PRECIPITATION

Joseph George Ferraro, Wyckoff, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 152,312, June 11, 1971, Pat. No. 3,772,901. This application Oct. 1, 1973, Ser. No. 402,534

Int. Cl.[2] D06F *39/02*

U.S. Cl. 8—137 5 Claims



1. A method of washing items with detergent containing soluble phosphate which comprises contacting in a tub means, the items to be washed with washing solution containing such detergent and, after completion of washing, removing the washing solution from the washed items, conveying said washing solution to a conduit running from said tub means to a sewer, drain or other means of disposal, supplying a suitable reactive chemical compound to said washing solution in said conduit, reacting the soluble phosphate in the washing solution with said reactive chemical compound in said conduit before discharge of the washing solution to said sewer drain or other means of disposal, so as to convert the soluble phosphate to insoluble form, said supplying step being effected by providing a Venturi section in said conduit for dispensing said reactive chemical compound and conveying said washing solution at a sufficient rate to create a vacuum in said Venturi section that draws a sufficient quantity of said reactive chemical compound into said washing solution, said reacting step being effected by the continuous addition to said washing solution from said Venturi section of from a stoichiometric proportion to a 200% excess, based on the soluble phosphate content of the removed washing solution, of a suitable precipitant salt chosen from the group consisting of oxides, hydroxides and soluble salts of calcium, aluminum and iron in an aqueous medium at a concentration of about 2 to about 80 weight percent to insolubilize substantially all of said phosphate.

3,954,404

DIPHENYL CONTINUOUS FOAM DYEING WITH FABRIC RUNNING OVER ROLLS IN FOAM BATH

Billy M. Childers, Chattanooga, Tenn., and Charles D. Fesperman, Jr., Dalton, Ga., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 265,228, June 22, 1972, abandoned, which is a continuation of Ser. No. 19,627, March 16, 1970, abandoned. This application June 3, 1974, Ser. No. 476,057

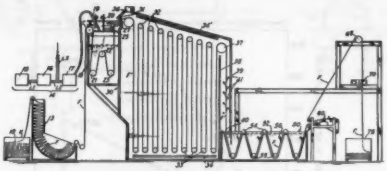
Int. Cl.[2] D06P *5/00*

U.S. Cl. 8—175 5 Claims

1. A method of continuously uniformly dyeing textile fibrous material comprising the steps of:

a. producing a large body of homogeneous foam at a pressure above atmospheric pressure, said foam containing a dye and a wetting agent and a biphenyl solvent;

b. dispensing said foam at atmospheric pressure by foam dispensing means;
c. receiving said foam from said dispensing means in a foam dye box vented to the atmosphere;
d. positioning said foam dispensing means above said box such that said foam is discharged into said box;
e. immersing said material in said foam and running said material repeatedly upwardly and downwardly through said foam at atmospheric pressure to effect penetration of said foam into said material, said material being continuously conveyed by roller means including at least one roller positioned in said box;



f. transversely reciprocating said dispensing means across the breadth of said box whereby said foam is discharged into said box at a level such that said roller is covered by said foam;
g. removing a predetermined amount of said foam from said material upon exit of said material from said foam by adjustable means; and
h. effecting fixation of said dye on said foam penetrated material by steaming said material.

3,954,405

PERMANENT-PRESS SYSTEM

Bernard F. North, Rock Hill, and George H. Lourigan, Chester, both of S.C., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Apr. 9, 1975, Ser. No. 565,071
Int. Cl.² D09M *13/34, 13/36*
U.S. Cl. 8—185 **9 Claims**

1. A fast, low-temperature curing composition for imparting permanent press properties to a cellulosic textile which consists essentially of an aqueous or aliphatic alcohol solution of dimethylol dihydroxyethylene urea or a partially or wholly methylated derivative thereof, phosphoric acid, and sodium metaborate.

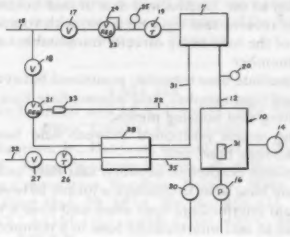
3,954,406

LOAD PREHEATING AND STERILIZING METHOD

Robert E. Chamberlain, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Continuation-in-part of Ser. No. 852,608, Aug. 25, 1969, abandoned. This application Mar. 14, 1972, Ser. No. 234,508
Int. Cl.² A61L *13/00*
U.S. Cl. 21—57 **4 Claims**

1. In combination, a process for preheating to a predetermined temperature an article to be sterilized in a sealed, semi-permeable package that would be damaged if exposed to vacuum and which will not tolerate temperatures above the temperature of saturated steam at atmospheric pressure followed by the introduction of a microbiocidal sterilizing gas comprising
a. loading said chamber with said article to be sterilized,
b. evacuating said chamber to a selected pressure level and continuing to evacuate said chamber and simultaneously
c. introducing air to said chamber at a pressure that will maintain a pressure in said chamber equal to atmospheric pressure less the saturated steam pressure at said desired temperature,
d. continuing said introduction of air and simultaneously introducing steam to said chamber at said saturated pressure whereby said chamber is maintained at said selected temperature, continuing said evacuation of said air and said introduction of said steam to said chamber for a period of time sufficient to heat said article to said desired temperature,



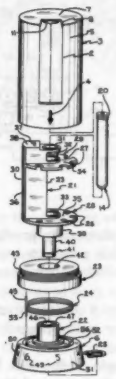
e. and then introducing a microbiocidal sterilizing gas to said chamber to sterilize said article.

3,954,407

AUTOMATIC TOOTHBRUSH STERILIZER

William A. Andary, 300 Armory Place, and Corydon L. Somes, 1309 John St., both of Sault Ste. Marie, Mich. 49783

Filed Sept. 12, 1974, Ser. No. 505,314
Int. Cl.² A61L *3/00*
U.S. Cl. 21—83 **4 Claims**



1. An apparatus for sterilizing and storing toothbrushes and the like, comprising, in combination:
holding means for a plurality of toothbrushes each of which toothbrush has a longitudinal axis;
said holding means having a longitudinal axis disposed substantially parallel to the longitudinal axes of said toothbrushes held in said holding means;
a germicidal lamp for irradiating the air about said toothbrushes;
housing means which cooperate with said holding means to supply electrical power to said lamp whenever the holding means is in a first position with respect to said housing means, and to prevent the supply of electrical power to said lamp whenever said holding means is no longer in said first position;
said lamp and said holding means being disposed within said housing means;
said housing means having an aperture therein to permit the removal and replacement of a toothbrush from said holding means when said holding means is no longer in said first position; said holding means blocking the aperture in

the housing means whenever the holding means is in said first position; and

said holding means includes:

a rigid member, maintaining the longitudinal axes of said plurality of toothbrushes in a substantially parallel relationship to the longitudinal axis of said holding means,

a base to receive said rigid member, with rotational movement of the base being directly translatable to rotate said rigid member

an intermediate base rotatably positioned between said base and said rigid member, said intermediate base threadedly accepting said housing means,

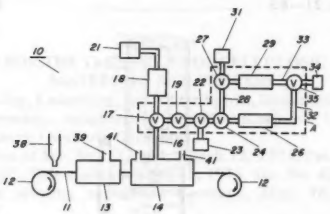
a bearing means positioned between said base and said intermediate base, and

spring means positioned between said base and said intermediate base so as to produce a torque between said base and said intermediate base when said base is rotated with respect to said intermediate base in a manner to result in movement of the holding means from the first position.

3,954,408
APPARATUS AND PROCESS FOR CHROMATOGRAPHIC PRODUCT DETECTION

Harry A. Dugger, Morristown, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Nov. 29, 1974, Ser. No. 528,343
Int. Cl.² G01N *31/08, 31/10, 31/12*
U.S. Cl. 23—230 PC **18 Claims**



1. A process for detecting products of liquid chromatographic analysis, which products may be either radioactively tagged with Carbon-14 or tritium or not tagged which comprises the steps of:

a. Applying either a radioactively Carbon-14 tagged, a tritium tagged or a non-tagged chromatographic sample to a moving wire;

b. Moving the sample on the wire first through an evporator oven to dry the sample, and then through a combustion furnace to combust the sample with a combustion gas to form either non-radioactive or Carbon-14 tagged or tritium tagged carbon dioxide gas and water;

c. When non-radioactive carbon dioxide gas is formed in step b), contacting the non-radioactive carbon dioxide gas with a nickel catalyst in a first catalytic furnace to convert the carbon dioxide gas to non-radioactive methane and hydrogen;

d. Conveying non-radioactive methane to a first detector means for sample detection;

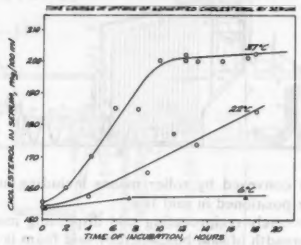
e. When Carbon-14 tagged radioactive carbon dioxide gas is formed in step b), conveying the Carbon-14 tagged radioactive carbon dioxide and water to a drying chamber to remove the water, and conveying the carbon dioxide gas to a second detector means for sample detection;

f. When tritium tagged radioactive carbon dioxide gas is formed in step b), conveying the tritium tagged radioactive water and carbon dioxide gas to a second catalytic furnace and contacting the water with an iron catalyst in the presence of hydrogen to convert the water to tritium gas and conveying the tritium gas to the second detector means for sample detection.

3,954,409
METHOD FOR DETERMINING SERUM CHOLESTEROL BINDING RESERVE AND USE IN DIAGNOSIS

Sung Lan Hsia, c/o Department of Dermatology, University of Miami School of Medicine, P.O. Box 520875 Biscayne Annex, Miami, Fla. 33152

Filed Apr. 22, 1974, Ser. No. 462,818
Int. Cl.² G01N *33/00*
U.S. Cl. 23—230 B **8 Claims**



1. A method for determining serum cholesterol binding reserve of human blood serum which comprises the steps of:

a. admixing in predetermined amounts an excess amount of finely divided cholesterol with a specimen of blood serum;

b. incubating the mixture for a period of time and at temperatures sufficient to maximize the solubilization of cholesterol in the serum while obtaining continuous contact of said serum with said cholesterol by suitable means;

c. separating the incubated serum of step (b) from the excess of cholesterol; and thereafter

d. measuring the amount of cholesterol in said incubated serum, and subtracting from this amount the measured cholesterol content of a reference specimen of the same serum prior to incubation with cholesterol.

3,954,410
SOLVENTS FOR NMR SPECTROSCOPY

Ludwig Pohl; Werner Theysohn, and Richard Unger, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Germany

Filed Oct. 26, 1973, Ser. No. 410,280
Claims priority, application Germany, Nov. 21, 1972, 2257005
Int. Cl.² C07C *29/00, 53/08;* **G01N** *27/00, 33/00*
U.S. Cl. 23—230 R **8 Claims**

1. A method of conducting NMR spectroscopy which comprises employing as an organic solvent for the spectroscopy an organic solvent containing carbon-13 in an amount less than 0.2 atom percent.

3,954,411
PREPARATION OF REAGENTS ON-LINE IN AUTOMATED SAMPLE ANALYSIS

Lloyd R. Snyder, Yorktown Heights, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,540
Int. Cl.² G01N *31/04, 33/00, 33/16*
U.S. Cl. 23—230 R **7 Claims**

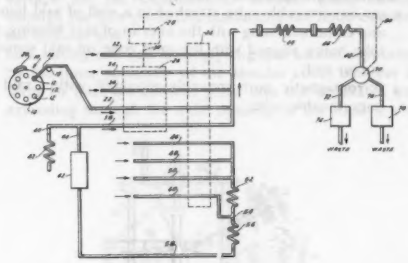
1. A method of preparing a reagent in sample analysis, comprising the steps of:

flowing a liquid sample stream along a first conduit position;

concurrently flowing streams of different liquid reactive substances in unused condition for reagent production in respective ones of a plurality of conduits;

combining successively the outflow of said plurality of conduits for formation of and reaction in a resultant stream for flow along a second conduit portion;

removing from said resultant stream in said second conduit portion an interferent with said sample analysis to produce a reagent stream free of said interferent; and



combining in a third conduit portion said sample and reagent streams from said first and second conduit portions respectively for flow in said third conduit portion toward analysis means.

3,954,412

TEST STRIP FOR PHENYLKETONE BODIES

Yasunao Ogawa, Ikeda, and Yukio Yonetani, Nara, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed June 17, 1974, Ser. No. 480,308

Claims priority, application Japan, Sept. 18, 1973, 48-105291

Int. Cl.² G01N *33/16*

U.S. Cl. 23—253 TP **3 Claims**

1. A test strip for the detection of phenylketone bodies which comprises diethylaminoethyl cellulose paper, a ferric salt selected from the group consisting of ferric chloride, ferric bromide, ferric fluoride, ferric sulfate, ferric ammonium sulfate, ferric nitrate, ferric phosphate, ferric oxalate and ferric citrate, and an alkali metal salt of ethylenediaminetetraacetic acid.

3,954,413

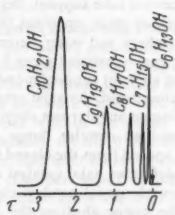
METHOD OF DETECTION OF CHROMATOGRAPHIC PEAKS

Viktor Fedorovich Kucherov, prospekt Vernadskogo, 97, korpus 1, kv. 13; Boris Antonovich Rudenko, ulitsa Fersmana, 13, kv. 21, both of Moscow, and Margarita Alexandrovna Baidarovtseva, p/o Chernogolovka, poselok NNTS, ulitsa Pervaya, 34, kv. 11, Moskovskaya oblast, Noginsky raion, all of

Filed Nov. 29, 1974, Ser. No. 528,566

Int. Cl.² G01N *31/12*

U.S. Cl. 23—254 EF **3 Claims**



1. A method of detection of chromatographic peaks in gas-liquid or gas-solid chromatography, consisting in the ionization of compounds selected from the group consisting of organic and metallo-organic compounds, said compounds being cut prior to the ionization in a chromatographic column and removed, in the form of fractions, from said column by an inert gaseous carrier, the ionization of said compounds being effected by way of burning them in the flame of formic acid vapours and accompanied by recording of chromatographic peaks by an electrometric method based on measurement of the increase in the degree of the ionization of the flame as said compounds are being introduced thereinto.

3,954,414

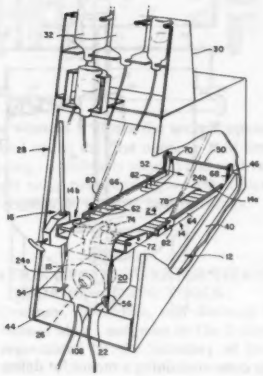
SELF-CONTAINED APPARATUS FOR THE STORAGE PROCESSING OF BLOOD

Wilfred J. Samson, Jr., Hanover; Gerald D. Fox, Walpole, and William E. Waye, Needham Heights, all of Mass., assignors to Damon Corporation, Needham Heights, Mass.

Filed Mar. 29, 1974, Ser. No. 456,121

Int. Cl.² A61M *1/03*; A47B *47/00*, *49/00*, *88/00*

U.S. Cl. 23—258.5 R **17 Claims**



2. In an instrument for the washing of red blood cells contained in a pliable bag-like container elongated between first and second ends, and having means forming a base support with two opposed ends and fitted with holding means adjacent one end thereof for attachment to such a container for disposing the first end thereof at a selected level relative to said base support, the improvement comprising

A. slide means having first and second slide ends and a slide bed therebetween, said slide means being pivotally mounted adjacent said second slide end to said base support means adjacent the other end thereof for elevational rotation of said first slide end relative to said second slide end above a lower position where said first slide end is at a selected level relative to said holding means and is above said second slide end, said slide bed and said slide ends being aligned with said holding means whereby a container attached to said holding means passes over said first slide end to said slide bed, and

B. means coupled between said slide means and said base support for selectively positioning the elevation of said slide means first end relative to said holding means.

3,954,415

VESSEL FOR EXTRACTING BITUMEN FROM TAR SANDS

H. James Davitt, Edmonton, Canada, assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Oct. 21, 1974, Ser. No. 516,313

Int. Cl.² B01D *11/02*; C10G *1/00*

U.S. Cl. 23—270 R **6 Claims**

1. A hot water process separation cell suitable for use in

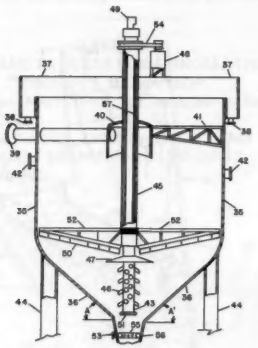
extracting bitumen from tar sands utilizing hydroseparation techniques comprising:

a. a tank having a vertical side wall and a bottom in the shape of a hollow inverted frusto-cone, the larger opening of the frusto-cone being attached to the lower end of the side wall, said cone having a slope as measured between the side wall of the cone and a plane perpendicular to the axis of the cone of at least 15°;

b. a hydroseparation liquid distributor centrally disposed within the frusto-conical bottom immediately adjacent to the smaller opening therein, said distributor having openings for delivering hydroseparation liquid into the frusto-conical bottom cavity;

c. means for delivering hydroseparation liquid to said hydroseparation liquid distributor;

d. a sand tailings discharge outlet connected to the smaller opening of the frusto-conical bottom comprising a discharge cone containing a means for delivering flush water into said cone;



e. at least one middlings outlet in the side wall of said cell for withdrawing middlings material therefrom;

f. an overflow launder on the upper end of said side wall and positioned adjacent to said tank to receive bitumen froth overflow,

g. a tar sands pulp inlet to said tank

h. a shed baffle located immediately above said hydroseparation liquid distributor and within said frusto-conical bottom, said shed baffle being in the shape of an inverted frusto-cone; and

i. a hollow rotatable center shaft running as a vertical axis from the top of the tank to the lower end of the vertical side wall, a means for rotating said shaft located at the upper end thereof and a sand rake connected to the lower end of said shaft.

3,954,416

APPARATUS FOR POSITIVELY DOPING SEMICONDUCTOR CRYSTALS DURING ZONE MELTING

Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 11, 1974, Ser. No. 487,390

Claims priority, application Germany, July 27, 1973, 2338338

Int. Cl.² B01J *17/10*

U.S. Cl. 23—273 SP **10 Claims**

1. An apparatus for introduction of a dopant into a semiconductor crystalline rod comprising:

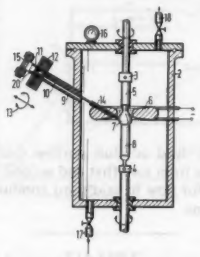
a gas impermeable hollow housing having a controlled gas inlet and gas outlet for introducing a select atmospheric environment within said housing;

a pair of selectively movable rod-holding members mounted on opposite walls of said housing for supporting a semiconductor crystalline rod therebetween;

an induction heating coil positioned within said housing and between said holding members so as to annularly surround the semiconductor rod mounted between said holding member and define a melt zone on said rod;

a gas impermeable tube attached to a wall of said housing and communicating with the interior of said housing, said tube being aligned with the melt zone on said semiconductor rod;

a ferromagnetic core movably mounted within said gas impermeable tube;



a relatively thin dopant source rod attached to a lower surface of said ferromagnetic core so as to be movable therewith within said gas impermeable tube, said induction heating coil being a flat coil and including a tube insert for guiding the dopant source rod through the coil to the melt zone; and

movable electromagnets positioned outside said gas impermeable tube in magnetically coupling relation with said ferromagnetic core for selective movement of said dopant source rod toward the melt zone of the semiconductor crystalline rod mounted between said holding members.

3,954,417

MONOLITHIC CATALYTIC CONVERTER WITH CENTRAL FLOW TUBE

John I. Jalbing, Millington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1974, Ser. No. 498,262

Int. Cl.² B01J *8/02, 35/04;* **F01N** *3/15*

U.S. Cl. 23—288 FC **2 Claims**

1. Apparatus for catalytically treating engine exhaust gases comprising:

a casing having a generally cylindrical body with a closed axial end and an open axial end;

an annular cover member having an outer perimeter flange engaging the open end of the casing and providing an axial catalyst element support and an inner periphery providing a central tube support, the annular cover member having one or more openings therethrough between the inner periphery and outer perimeter flange defining an outlet for engine exhaust gases from the apparatus;

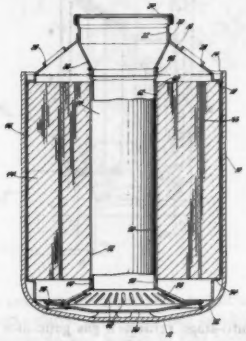
an axial catalyst element support member within the casing adjacent its closed end, the axial catalyst element support member having an annular rim abutting the closed end of the casing and an annular flange radially outside the annular rim, spaced from the closed end of the casing and effective to define an axial catalyst element support;

an annular circumferential catalyst element support member within the casing abutting the cylindrical body and defining a circumferential catalyst element support;

an annular monolithic catalyst element supported within the casing axially between the outer perimeter flange of the annular cover member and the annular flange of the axial catalyst support member and circumferentially within the

circumferential catalyst element support member, the catalyst element having an inner cylindrical surface defining an axial opening therethrough, the catalyst element having a honeycomb structure defining a plurality of axial flow paths therethrough and coated with a catalyst substance within the flow paths and on the inner cylindrical surface for the treatment of exhaust gases flowing through the flow paths and contacting the inner cylindrical surface; and

a tube having one end sealingly engaged to and supported by the inner perimeter of the annular cover member to form an inlet for exhaust gases into the apparatus and extending through the axial opening of the catalyst ele-



ment for substantially its entire length to another end to conduct exhaust gases to the closed end of the casing for return flow through the flow paths to the outlet, the tube being radially spaced from the inner cylindrical surface by only the distance required to allow normal relative radial thermal expansion and contraction between the tube and catalyst element, whereby some gases are allowed to leak therebetween from the closed end of the casing to the outlet but gases so leaking are brought into contact with the inner cylindrical surface of the catalyst element for substantially its entire length and are thus substantially completely catalytically treated so that no seal is required between tube and catalyst element.

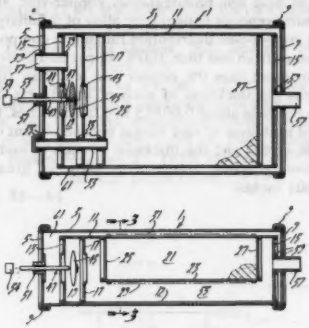
3,954,418

CATALYTIC CONVERTER WITH BYPASS

James D. Stormont, Grass Lake, Mich., assignor to Tenneco Inc., Racine, Wis.

Filed Sept. 27, 1972, Ser. No. 292,495
Int. Cl.[2] B01J *8/02*; **F01N** *3/15, 7/00*
U.S. Cl. 23—288 FA **6 Claims**

1. A catalytic converter comprising a tubular outer housing having inlet means and outlet means for a gas stream to be purified, an inner housing including catalyst bed means providing a catalyst bed in said inner housing and having a perforate inlet wall and a perforate outlet wall, gas to be purified flowing from the inlet wall to the outlet wall through the catalyst bed, inlet chamber means in said inner housing forming an inlet chamber, said inlet means opening into said inlet chamber, said inlet chamber means having first and second openings therein for gas to leave the inlet chamber, inlet gas passage means in the outer housing for the passage of gas from the first of said inlet chamber openings to said perforate inlet wall, outlet gas passage means in said outer housing for the passage of gas from said perforate outlet wall and from the second of said openings in the inlet chamber to said outlet means, and flow control means responding to the temperature of the catalyst bed including a valve means having a first position wherein it closes the first opening in said inlet chamber and opens the second opening thereby causing said gas stream to by-pass said catalyst bed and to flow directly from said inlet chamber to said outlet gas passage means and a



second position wherein it closes the second opening in said inlet chamber and opens the first opening, said first and second openings being rectilinearly aligned and said valve means including a single valve head having two valve faces thereon and rectilinearly movable to close said openings.

3,954,419

FABRICATION OF NONSPARKING TITANIUM DIBORIDE MINING TOOLS

Lawrence P. Kaufman, Brookline, and Richard L. Pober, Newtonville, both of Mass., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed June 19, 1975, Ser. No. 588,548
Int. Cl.[2] C22C *29/00, 1/05*
U.S. Cl. 29—182.5 **5 Claims**

1. A composite metallurgical composition comprising approximately 84 to 86 per cent by weight of titanium diboride, and approximately 16 to 14 per cent by weight of copper and of nickel.

4. The method of producing a composite metallurgical composition comprising forming a mixture consisting of approximately 84 to 86 per cent by weight of powdered titanium diboride and approximately 16 to 14 per cent by weight of powdered copper and powdered nickel, heating said mixture to about 1900° to 2100°F, applying a hydraulic pressure of approximately 2700 to 3000 psi to said mixture, and then heating said mixture to approximately 2600° to 2700°F while applying said hydraulic pressure.

3,954,420

NON-FERROUS CORROSION RESISTANT UNDERCOATING

Jacob Hyner, Waterbury, and Stephen Gradowski, Torrington, both of Conn., assignors to Whyco Chromium Co., Inc., Thomaston, Conn.

Filed June 24, 1975, Ser. No. 589,768
Int. Cl.[2] B32B *15/00*
U.S. Cl. 29—183.5 **3 Claims**

1. A non-ferrous plated undercoating for providing improved corrosion resistance and facilitating top-plating to a ferrous metal substrate comprising:

a. a first layer of copper plated on said substrate;

b. a first zone of non-homogeneous copper-zinc alloy of inifinitely variable linear copper-zinc distribution contiguous with said first layer of copper;

c. a layer of zinc contiguous with said first zone of said non-homogeneous copper-zinc alloy;

d. a second zone of non-homogeneous copper zinc alloy of infinitely variable linear copper-zinc distribution contiguous with said layer of zinc; and

e. a second layer of copper contiguous with said second zone of said non-homogeneous copper-zinc alloy, said non-homogeneous copper-zinc alloy of infinitely variable linear copper-zinc distribution ranging in composition, by weight, of from less than 100% copper and more than 0% zinc to more than 0% copper and less than 100% zinc, wherein the thickness of each of said layers of copper range between about 0.00015 to 0.0005 inches, the thickness of said layer of zinc ranges between about 0.0002 to 0.0006 inches and the thickness of each of said zones of non-homogeneous copper-zinc alloy is greater than 0.00001 inches.

3,954,421

ALLOYS FOR HIGH CREEP APPLICATIONS

Julius Heuschkel, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 242,303, April 10, 1972, abandoned. This application Dec. 17, 1974, Ser. No. 533,586

Int. Cl.² F16L *9/02*; C22C *38/42*

U.S. Cl. 29—183 9 Claims

1. In an apparatus operating under conditions requiring resistance to high creep such that it must be capable of resisting rupture for a time interval substantially greater than 8125 hours at 1050°F under constant stress of about 20,000 pounds per square inch, said apparatus having castings or fluid conductors, the improvement wherein said casings or fluid conductors are in the form of a casting of ferrous material consisting essentially of the following composition in weight percent:

Mn — 0–0.01
Si — 0–0.50
Cu — 2.00
V — 0–0.50
C — 0.18
Ni — 2.50
Cr — 1.50
Mo — 2.00
W — 2.00
Fe — Remainder.

6. In an apparatus operating under conditions requiring resistance to high creep exceeding load resistance of 1150 ton-hours, said apparatus having casings or fluid conductors, the improvement wherein said casings or fluid conductors contain welds of a ferrous alloy having the composition consisting essentially of the following in weight percent:

C — 0.078 to 0.201
Mn — 0.032 to 0.091
Si — 0.04 to 0.53
Cu — 0.68 to 1.81
Ni — 0.56 to 3.67
Cr — 0.20 to 1.06
Mo — 1.66 to 1.92
V — 0.41 to 0.85
W — 0 to 0.20
Co — 0.008 to 1.01
Fe — Remainder.

3,954,422

MULTI-STAGE REFORMED-GAS GENERATOR

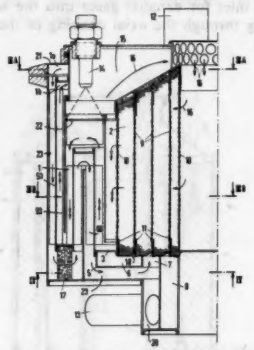
Hellmuth Mentschel, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 26, 1974, Ser. No. 446,093

Claims priority, application Germany, Mar. 6, 1973, 2310995

Int. Cl.² C10B *1/00*

U.S. Cl. 48—89 17 Claims



1. In a multi-stage reformed gas generator having at least two reaction chambers each containing a charge of catalyst material connected in series in the flow direction, the flow through each of said two reaction chambers being in a first direction, said generator also including means supplying a gas serving as an oxygen carrier to each of the reaction chambers and means for supplying fuel gas and causing a flow of said fuel gas through said chambers in said first direction wherein the improvement comprises:

a. gas permeable means separating said reaction chambers, said gas permeable means constructed to supply said gas serving as an oxygen carrier to said fuel gas flowing through said chambers said oxygen carrier gas in said gas permeable means flowing in a second direction essentially perpendicular to said first direction whereby the oxygen containing gas and fuel gas are contacted with each other substantially in perpendicular direction to their respective flows in said chamber; and wherein

b. said means for supplying a gas serving as an oxygen carrier are connected to said gas permeable means.

3,954,423

QUICK START DEVICE FOR REFORMED-GAS GENERATORS

Hans Hamper, Erlangen, and Christian Koch, Nurnberg-Grossgrundlach, both of Germany, assignors to Siemens AG, Munich, Germany

Filed Feb. 6, 1974, Ser. No. 439,883

Claims priority, application Germany, Feb. 7, 1973, 2306025

Int. Cl.² C01B *2/16*

U.S. Cl. 48—107 3 Claims

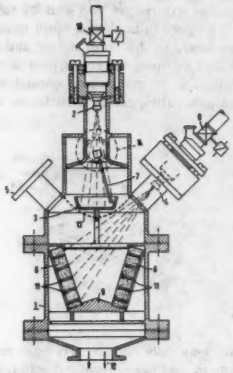
1. A rapid starting device for a reformed gas generator comprising:

a. first means for injecting and atomizing liquid fuel supplied thereto;

b. a flame dish arranged relative to said first means for injecting and atomizing such that the flame dish will receive atomized fuel from said first means for injecting and atomizing;

c. means for supplying an oxygen carrying gas;

d. means for igniting the atomized fuel collected in said flame dish to produce hot gases;
e. second means for injecting and atomizing fuel supplied thereto;
f. a catalyst for the catalytic conversion of liquid fuel, arranged relative to said second means for injecting and atomizing such that the fuel atomized by said second means for injecting and atomizing, is directed toward said catalyst;



g. means to conduct hot gases produced in said flame dish toward said catalyst to heat up said catalyst;
h. means to couple fuel supply to said second means for injecting and atomizing when said catalyst is heated to the temperature necessary for the fuel to react; and
i. means to couple the fuel supply to said first means for injecting and atomizing, said latter means to couple including means to turn off the fuel supply when said fuel supply is coupled to said second means for injecting and atomizing.

3,954,424

PROCESS FOR PRODUCING A METHANE-CONTAINING GAS AND ARRANGEMENT THEREFOR

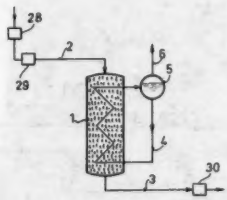
Eberhard Goeke, and Hermann Staege, both of Essen, Germany, assignors to Krupp-Koppers GmbH, Essen, Germany

Filed May 15, 1974, Ser. No. 470,030

Claims priority, application Germany, May 23, 1973, 2326234

Int. Cl.² C01B 2/16

U.S. Cl. 48—215 **6 Claims**



1. A process of making a methane-rich gas from the gaseous product obtained in the partial oxidation of coal or heavy oil, the said process comprising substantially desulfurizing said gaseous product and then subjecting it to simultaneous conversion and methanization reactions, at a temperature between 280° and 500°C and a pressure of 3 to 60 atmospheres above atmospheric, the said two reactions being carried out in at least one common reaction chamber in the presence of separate conversion and methanization catalysts arranged in at least one fixed bed in said reaction chamber.

3,954,425

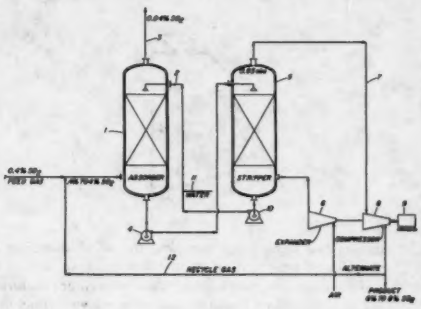
ABSORPTION OF SO_2 FROM A DILUTE GAS AND DESORBING IT AT HIGHER CONCENTRATIONS INTO A STRIPPING GAS

Arnold Gunther, West Orange, N.J., assignor to Treadwell Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 132,752, April 9, 1971, abandoned, which is a continuation-in-part of Ser. No. 860,138, Aug. 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 724,565, April 26, 1968, abandoned. This application Apr. 27, 1973, Ser. No. 355,289

Int. Cl.² B01D 19/00, 53/14

U.S. Cl. 55—44 **4 Claims**



1. A process of concentrating SO_2 from feed gases containing less than about 3% SO_2, which comprises in combination,
a. absorbing the gas in an aqueous solvent for SO_2, consisting essentially of water, at ambient pressure to produce a solution of SO_2 in the solvent,
b. stripping the SO_2 from the solution produced by a fixed stripping gas at a sub-atmospheric pressure,
c. expanding the stripping gas to the subatmospheric pressure of stripping in a gas expander to produce power and utilize the power produced as, for example, at least part of the power for compressing the off gas from the stripping and
d. recompressing of gases from the stripping to substantially atmospheric pressure.

3,954,426

METHOD FOR CLEANING A DUST FILTER

Lennart Bertil Vilhelm Brange, Malmo, Sweden, assignor to Inoma Filter AB, Skelleftea, Sweden

Filed Feb. 25, 1974, Ser. No. 445,419

Claims priority, application Sweden, Feb. 26, 1973, 7302633

Int. Cl.² B01D 46/04

U.S. Cl. 55—96 **9 Claims**

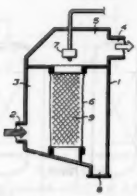
1. A method for cleaning dust filters of the kind comprising an inlet for comtaminated fluid; an outlet for purified fluid; a fluid permeable filter element including wall means of a flexible material which is impermeable to solid particles exceeding a certain size and which separates the inlet from the outlet, said filter elements having an axis and defining an axial flow passage for the fluid being filtered; and an oscillation generating member disposed at one end of the flow passage for supplying gas impulses to the fluid in the flow passage for imparting movement to the filter element, which method comprises the steps of:

a. supplying a fluid to be purified to said inlet;

(b) causing said fluid to flow from said inlet through said filter element and said flow passage to said outlet;

c. imparting to the filter element by means of said gas impulses a first wave movement materializing in oscillations in the wall means of the filter element, said oscillations having a selected frequency and propagating in the axial direction of said filter element at a selected velocity, said oscillations being in the transverse direction relative to said axis and to the surface of the filter element before the element is subjected to said oscillations such that in a cross section of the filter element taken on a plane perpendicular to said axis and to the direction of the propagation of said first wave movement, at any given time, the movement of said wall means due to said oscillations will have the same direction with respect to said axis at all locations along the periphery of the filter element lying in said plane;

d. imparting to the fluid existing in the flow passage by means of said gas impulses a second wave movement



having the same frequency and the same direction and velocity of propagation in the flow passage as said first wave movement, said second wave movement materializing in the form of pressure and velocity variations in the fluid existing in the flow passage and traveling substantially in the direction of propagation of said second wave movement;

e. coupling said movement to one another in such a way that the movement amplitude of the oscillation of the filter element and the pressure and velocity amplitudes of the oscillation of the fluid in the flow passage will reach their peaks essentially simultaneously in every specific cross section of the flow passage; and

f. limiting said gas impulses to a range having a lower limit frequency at which the wave length of said movements substantially coincides with the length of the filter element in the direction of the flow passage, and an upper limit frequency at which a quarter of a wave length of said movements substantially corresponds to the smallest distance across the flow passage taken perpendicular to the direction of the flow passage.

3,954,427

VENTILATION AND FILTER MODULE FOR COOKING UNITS

Louis J. Jenn, Indianapolis, Ind., assignor to Jenn Air Corporation, Indianapolis, Ind.

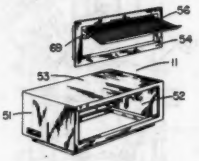
Continuation-in-part of Ser. No. 406,891, Oct. 16, 1973, abandoned. This application Nov. 15, 1974, Ser. No. 524,039

Int. Cl.[2] B01D *23/20*

U.S. Cl. 55—217 **6 Claims**

1. A free-standing fume collecting unit of modular construction and adapted to be positioned immediately adjacent one or more fume-generating cooking surfaces, said unit comprising a discrete, generally rectangular base module, a powered exhaust means in said base module discharging to the exterior of said unit, removable filter elements in the base module positioned to filter the intake of said exhaust means, and a generally rectangular, discrete upper module overlying said base module with openings in the contiguous module faces to provide communication between their interiors, said upper module having at least one intake opening extending across the side of said upper module closest to a cooking surface, a positionably adjustable closure member provided for said intake opening movable between adjusted open position and fully closed position, and abnormal temperature responsive means for moving said closure member to fully closed position upon the existence of a predetermined abnormal temperature at said intake opening, whereby air and fumes moving from said cooking surface are drawn through said intake opening, move through said upper module into said base module to be discharged at the exterior of the unit by said exhaust means and said intake opening is closed upon occurrence of an abnormal temperature in the entering air and fumes.

6. A free-standing fume collecting unit of modular construction and adapted to be positioned immediately adjacent one or more fume-generating cooking surfaces, said unit compris-



ing a discrete, generally rectangular base module, a powered exhaust means in said base module discharging to the exterior of said unit, removable filter elements in the base module positioned to filter the intake of said exhaust means, a door provided on said base module to permit access to said filter elements and exhaust means, a receptacle on the inner face of said door for collecting grease trapped by said filter elements, and a generally rectangular, discrete upper module overlying said base module with openings in the contiguous module faces to provide communication between their interiors, said upper module having at least one intake opening extending across the side of said upper module closest to a cooking surface, whereby air and fumes moving from said cooking surface are drawn through said intake opening, move through said upper module into said base module to be discharged at the exterior of the unit by said exhaust means.

3,954,428

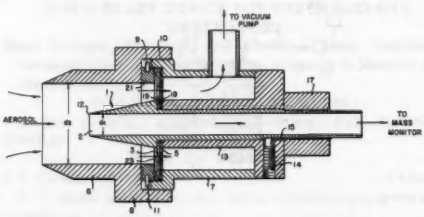
PRECISION AEROSOL DIVIDER

Virgil A. Marple, Plymouth, and Kenneth T. Whitby, Golden Valley, both of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 28, 1975, Ser. No. 599,741

Int. Cl.[2] B01D *46/00*

U.S. Cl. 55—270 **7 Claims**



1. A precision aerosol divider comprising:

a hollow filter holder body having an inlet for an aerosol flow and a first and second flow outlet, said holder body also having means for holding a probe upright approximately in the center of the holder to thereby connect said inlet to the first of said two outlets;

an isokinetic hollow probe with a center passageway insertable in said means for holding a probe, said probe having an upper edge facing the inlet to split the aerosol flow;

a small probe filter with a large center hole held between said probe and holder body to receive the flow stream to the second of said two outlets after it is split by the probe's edge.

3,954,429

GERM-FREE AIR SUPPLY DEVICE

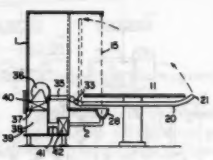
Dirk van der Waaij, Voorburg, Netherlands, assignor to Pieter Kenrood-Vinitex B.V., Assendelft, Netherlands

Continuation-in-part of Ser. No. 263,587, June 16, 1972, Pat. No. 3,893,457. This application Sept. 9, 1974, Ser. No. 504,194

Claims priority, application Netherlands, Sept. 25, 1973, 7313227

Int. Cl.² B01D *50/00*

U.S. Cl. 55—279 **10 Claims**



1. In a device for supplying a germ-free air flow over an operating table, said device including a filter cabinet having a blower means therein and a substantially vertical exit surface, means cooperating with the blower to form a supply of germ-free air, the cabinet having a front wall and being positionable at one extremity of an operating table, the width of the filter cabinet being such that outflowing air also covers the space laterally thereof, the improvement comprising

means cooperating with said cabinet to provide for germ-free air flow,

said means including a substantially U-shaped tube, including side legs interconnected by a transverse leg,

said tube being provided with openings for flow of germ-free air therethrough,

supply tube means mounted in spaced parallel relation to the cabinet front wall and disposed in a generally horizontal plane,

the side legs extending outwardly of said supply tube away from the cabinet front wall and being spaced from each other by said transverse leg, and

means mounting said U-shaped tube in rotatable relationship with said supply tube means for rotational movement of said U-shaped tube around the longitudinal axis of said supply tube means whereby said U-shaped tube may be moved between a vertical and horizontal position.

3,954,430

LIQUEFACTION OF CHLORINE BY MULTI-STAGE COMPRESSION AND COOLING

Daniel L. Curtis, New Martinsville, W. Va.; John D. Earls, Bellaire, Ohio, and Joseph E. Fraker, Jr., New Martinsville, W. Va., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 30, 1974, Ser. No. 519,163

Int. Cl.² F25J *3/06*

U.S. Cl. 62—23 **8 Claims**

1. In a method of liquefying chlorine out of a chlorine rich feed gas mixture containing chlorine gas and non-condensable gases, which method comprises:

A. feeding the gas mixture to compressor means and compressing the gas within the compressor means;

B. feeding the compressed gas mixture to condenser means and recovering liquid chlorine and a second gas mixture, reduced in chlorine content, from the condenser;

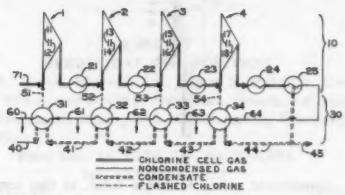
C. feeding the liquefied chloride from the condenser means to a heat exchanger means as a refrigerant while feeding the second gas mixture to the heat exchanger means in indirect thermal contact with the liquefied chlorine;

D. recovering liquefied chlorine condensed out of said second gas mixture; and

E. passing chlorine refrigerant vaporized in the heat exchanger means back to said compressor means; the improvement comprising:

A. compressing the feed gas mixture in compressor means containing a plurality of individual compressors in series, thereby increasing the feed gas pressure from the first compressor through at least a subsequent compressor to a last compressor in the compressor means;

B. feeding the liquefied chlorine sequentially through a heat exchanger means containing a plurality of individual heat



exchangers in series, from a high pressure end from an outlet of the condenser means through a heat exchanger to a low pressure while feeding the second gas mixture through the heat exchanger means, thereby vaporizing the liquid chlorine refrigerant in the individual heat exchangers at decreasing pressures along the series of individual heat exchangers in the direction of flow, condensing chlorine out of second gas mixture;

C. recovering the chlorine condensed out of the second gas mixture; and

D. passing substantially all of the chlorine refrigerant vaporized in a first individual heat exchanger to a first individual compressor having a suction pressure which is, relative to all of the individual heat exchangers of said heat exchanger means, most nearly equal to but lower than the pressure of said individual heat exchanger,; and

E. repeating steps (C) through (D) for all of said individual heat exchangers in said heat exchanger means while recovering the chlorine condensed out of the second gas mixture in the said heat exchangers.

3,954,431

OPTICAL GLASS AND ITS PRODUCTION

James William Fleming, Jr., Piscataway; Raymond Edward Jaeger, Basking Ridge, and Thomas John Miller, Green Brook, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 26, 1974, Ser. No. 509,652

Int. Cl.² C03B *1/00, 23/20*

U.S. Cl. 65—18 **7 Claims**

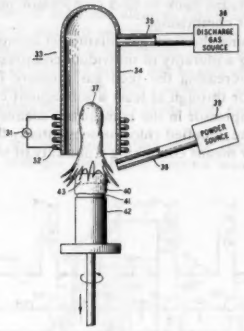
1. Method of producing an essentially bubble-free glass boule, suitable for use as a low loss optical waveguide material, and of good composition control in mixed oxide glass systems which include relatively volatile minor constituents, comprising

1. introducing a quantity of homogeneous prereacted particulate matter into a gas stream, said matter being of such particle size as to pass through a 20 mesh screen but not through a 100 mesh screen

2. directing the gas-particle stream into a plasma discharge against a bait, thereby fusing the particulate matter to

form said glass boule wherein the particulate matter has been produced by

a. producing an intimate mixture of glass forming materials, which materials comprise at least 50 mole percent of a major constituent and at least 5 mole percent and less than about 40 mole percent of at least one minor constituent, at least one of which minor constituents, when in oxide form, possesses a vapor pressure at least 1.5 times as great as the vapor pressure of the major



constituent, when in oxide form, at the temperature necessary to fuse the particulate matter to form the glass body;

b. producing a particulate precursor material from the intimate mixture;

c. heat treating the particular precursor material to produce an at least partially glassy product, and

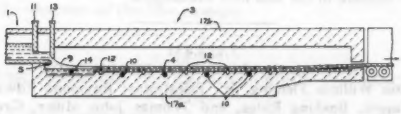
d. screening the heat treated material and selecting a cut of powder passing through a 20 mesh screen but not passing through a 100 mesh screen.

3,954,432

METHOD FOR IMPROVING THE QUALITY OF FLAT GLASS FORMED ON A BATH OF MOLTEN TIN

Merritt J. Hummel, Lower Burrell, and Thomas J. Nier, Cheswick, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 15, 1974, Ser. No. 514,988
Int. Cl.² C03B 18/02
U.S. Cl. 65—27 **11 Claims**



1. In a method for forming flat glass wherein molten glass is continuously delivered into a forming chamber and deposited onto a pool of molten tin upon which the molten glass is supported and advanced as the molten glass is cooled and subjected to attenuating forces to cause a dimensionally stable, continuous sheet of glass to be formed therefrom, the method being further characterized by a rapid rate of cooling of the glass as it is advanced along the molten tin such that the viscosity of the glass increases at an average rate of at least 450,000 poises per minute from its delivery into the forming chamber until it reaches a viscosity of approximately $10^{6.0}$ poises, the improvement comprising:

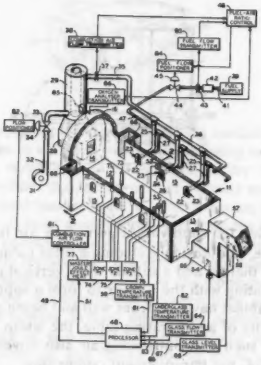
adding to the pool of molten tin, by means separate from the glass itself, an oxidizing agent capable of oxidizing stannous tin to stannic tin in the environment of molten glass, said oxidizing agent being added in the form of a higher oxide of a multivalent metal, and said oxidizing agent being maintained in a sufficient concentration in a region of the molten tin contacting glass whose viscosity is no more than $10^{6.5}$ poises to substantially avoid the formation of top surface distortion in the glass.

3,954,433

METHOD OF AND APPARATUS FOR COORDINATING THE APPLICATION OF HEAT TO A MELT FROM SOURCES ABOVE AND BELOW THE MELT SURFACE

Robert W. Holler, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 22, 1974, Ser. No. 499,732
Int. Cl.² C03B 5/24
U.S. Cl. 65—29 **21 Claims**



1. Apparatus for melting and maintaining a heat softenable material at a desired temperature comprising a container for said material; lower heating means in said container adapted to apply heat to the material from within the body of the material; upper heating means in said container adapted to apply heat to the material from above the body of the material; means for sensing a required change in the amount of heat applied to the body of material; first means to adjust the amount of heat applied to said material by said lower heating means; second means to adjust the amount of heat applied to said material by said upper heating means; and means responsive to said means for sensing a required change in the amount of heat applied to actuate both said first and second adjusting means including a ratio controller for issuing control signals to the respective first and second adjusting means in a predetermined relationship to satisfy said required change in the amount of heat applied.

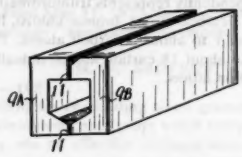
19. The method of operating a glass melter which comprises heating the melter with fossil fuel burners above the glass constituents therein; heating the glass with Joule effect heating; sensing the amount of heat required to establish and maintain a predetermined temperature in the glass; and operating a common control for both the fossil fuel burners and the Joule effect heating to establish and maintain a predetermined relationship between the amount of heat developed by the fossil fuel burners and that amount of heat developed with Joule effect heating.

3,954,434

METHOD OF MANUFACTURING A FERRITE MAGNETIC TRANSDUCER HEAD

Tomio Kobayashi, and Kazuo Nozawa, both of Tagajo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 14, 1975, Ser. No. 549,971
Claims priority, application Japan, Feb. 21, 1974, 49-20716
Int. Cl.² C03B 23/20
U.S. Cl. 65—43 4 Claims



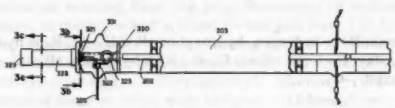
1. A method of manufacturing a ferrite magnetic transducer head comprising the steps of:
   a. placing two Mn - Zn ferrite core blocks spaced apart with respect to each other to form an effective gap;
   b. placing glass material containing Fe_2O_3 between 7 and 30 weight percents and ZnO between 3 and 25 weight percents (of the total weight of said glass);
   c. melting said glass and flowing the same into said gap between said two ferrite cores; and
   d. cooling said cores at a rate to form homogeneous dispersion of fine precipitates of Zn - Fe - O in said glass.

3,954,435

LASER CONSTRUCTION AND TUNING METHOD

James R. Fendley, Haddon Heights, and Carl Harry Knowles, Morrestown, both of N.J., assignors to Metrologic Instruments, Inc., Bellmawr, N.J.

Continuation of Ser. No. 390,889, Aug. 23, 1973, Pat. No. 3,859,072. This application July 19, 1974, Ser. No. 490,186
Int. Cl.² C03B 23/06
U.S. Cl. 65—54 2 Claims



1. In a process for fabricating laser apparatus having an outer envelope, the method of securing mirrors in precise adjustment with said laser apparatus comprising the steps of:
   a. mounting said mirrors permanently and rigidly at the ends of said envelope substantially normally to the principal axis of said apparatus;
   b. energizing said laser apparatus;
   c. heating a relatively narrow portion of said envelope in the region of at least one of said mirrors; and
   d. permanently deforming said narrow portion of said housing by applying sufficient transverse force to said one of said mirrors to produce efficient lasing action in said apparatus.

3,954,436

REACTIVE TENSIDE SOIL CONDITIONERS

János Vad; Béla Bartha, both of Budapest; Miklós Nádasy, Veszprem; Ottó Dobozy; Ferenc Maté, both of Budapest; Miklós Kovács; Márton Kölcsei, both of Veszprem, and Eva Karacsonyi, nee Spindler, Budapest, all of Hungary, assignors to Novex Rt., Budapest, Hungary

Filed Dec. 7, 1973, Ser. No. 422,891
Claims priority, application Hungary, Dec. 7, 1972, EE 2075
Int. Cl.² C05C 13/00, 9/02; C08G 12/12
U.S. Cl. 71—27 2 Claims

1. A process for improving plant yield comprising applying to the soil in which the plant is to be grown an amount effective to improve plant yield of a reactive tenside selected from the group consisting of addition products, having a molecular weight under 15,000, of one or more of (i) guanidine and dicyandiamide, with one or more of (ii) formaldehyde, acetaldehyde, propionaldehyde, and C_{2-6} dihalogenealkanes, acid addition salts of said addition products, and mixtures thereof.

3,954,437

HERBICIDAL COMPOSITION

Donald W. Gates, Monroe, La.; Eldon S. Ratcliffe, Cottage Grove, Minn., and David J. Prochaska, Seneca, S.C., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 16, 1974, Ser. No. 532,888
Int. Cl.² A01N 9/22
U.S. Cl. 71—91 4 Claims

1. A herbicidal composition characterized by containing, in effective amounts, an admixture of one part by weight of 5-acetamido-2,4-dimethyltrifluoromethanesulfonanalide or a horticulturally acceptable salt thereof with from about 0.1 to 5 parts by weight of 3-isopropyl-1H-2,1,3-benzothiadiazin-(4)3H-one 2,2-dioxide or a horticulturally acceptable salt thereof as active components.

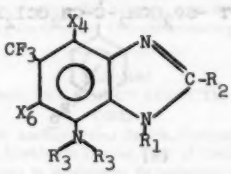
3,954,438

5-TRIFLUOROMETHYL-7-AMINOBENZIMIDAZOLES HERBICIDES

Don L. Hunter; Robert A. Smith, both of Anaheim, and Wayne S. Belles, Orange, all of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 333,902, Feb. 20, 1973, abandoned. This application June 3, 1974, Ser. No. 476,012
Int. Cl.² A01N 9/22
U.S. Cl. 71—92 16 Claims

1. A herbicidal composition comprising an herbicidally effective amount of a compound of the formula



in which R_1 represents hydrogen, lower alkyl, halo-substituted lower alkyl, lower cycloalkyl, halo-substituted lower cycloalkyl, hydroxy-substituted lower alkyl, lower alkoxy-substituted lower alkyl or di-lower alkylamino, R_2 represents hydrogen, lower alkyl, lower cycloalkyl, hydroxy-substituted lower alkyl, lower alkoxy-substituted lower alkyl, halo, or di-lower alkylamino, each R_3 is selected from the group consisting of hydrogen and lower alkyl, and each of X_4 and X_6 represents hydrogen, halo, lower alkoxy or amino of the formula

and in which not more than one of said R_1 and R_2 represents hydrogen and not more than one of said X_4 and X_6 represents

and a carrier therefore.

3,954,439

HERBICIDAL COMPOSITIONS

Stavros Papamichael, Cambridge, and Ross Mortimore Ward Dyer, Cheadle, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 8, 1973, Ser. No. 339,063

Claims priority, application United Kingdom, Aug. 3, 1972, 10751/72; Jan. 24, 1973, 3607/73

Int. Cl.² A01N 9/22

U.S. Cl. 71—93 **23 Claims**

1. A composition, in water dispersable granular form, comprising at least 50% by weight, based on total solids, of a herbicidal material selected from the group consisting of chlorotriazines, methylthiotriazines, substituted ureas, azidotriazines, 3,5-dibromo-4-hydroxy-benzaldoxime-0-(2',4'-dinitrophenyl)ether, and mixtures thereof and from about 5–15% by weight, based on total solids, of one or more surfactants selected from the group consisting of ethylene oxide condensates with alkyl phenols or fatty alcohols, lignosulphonates, ammonium salts of mixtures of aromatic sulphone sulphonic acids condensed with formaldehyde, and mixtures thereof; substantially all of said granules having a mean particle size of at least 0.1 mm; said composition having an active suspensibility, as hereinbefore defined, of at least 60%.

3,954,440

SUBSTITUTED 2-HYDROXY-2-PHENYLBUTYLSULFONATE COMPOUNDS

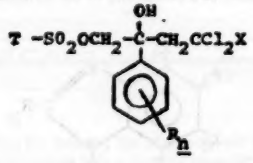
Lowell D. Markley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 466,568, May 3, 1974, Pat. No. 3,900,509. This application Mar. 10, 1975, Ser. No. 556,605

Int. Cl.² A01N 9/14

U.S. Cl. 71—103 **21 Claims**

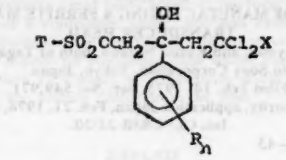
1. A composition comprising a herbicidally-effective amount of a compound of the formula:



(I)

wherein X represents chloro, *n* represents an integer of 0 to 3, inclusive; R is ring-substituted in the 3, 4 or 5-ring position and each R independently represents trifluoromethyl, alkyl of from 1 to about 3 carbon atoms, bromo, chloro, fluoro, nitro or alkoxy of from 1 to about 3 carbon atoms; T represents alkyl of from 1 to about 18 carbon atoms, haloalkyl of from 1 to about 4 carbon atoms and an inert solid or liquid carrier therefor.

13. The method of controlling undesired plant growth which comprises applying to the locus of said plants a herbicidally-effective amount of a compound of the formula:



(I)

wherein: X represents chloro, n represents an integer of 0 to 3, inclusive; R is ring-substituted in the 3, 4 or 5-ring position and each R independently represents trifluoromethyl, alkyl of from 1 to about 3 carbon atoms, bromo, chloro, fluoro, nitro or alkoxy of from 1 to about 3 carbon atoms; T represents alkyl of from 1 to about 18 carbon atoms, haloalkyl of from 1 to about 4 carbon atoms.

3,954,441

(ALKYNYLOXY)ALKYL AND (ALKENYLOXY)ALKYL CARBAMATES AND THEIR USE AS HERBICIDES

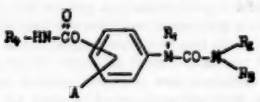
Barrington Cross, Rocky Hill, and Charles Paul Grasso, Cranbury, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 344,667, March 26, 1973, Pat. No. 3,867,429. This application Oct. 15, 1974, Ser. No. 514,858

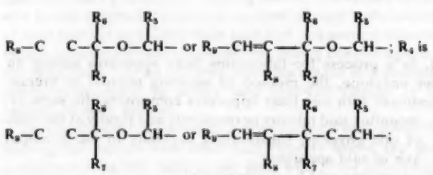
Int. Cl.² A01N 9/24

U.S. Cl. 71—106 **12 Claims**

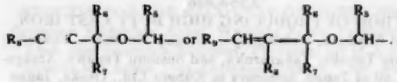
1. A method for the control of undesirable plant species, comprising applying to the foliage of the plants or to the soil containing seeds of the undesirable plants, a herbicidally effective amount of a compund having the formula:



wherein R_1 is hydrogen, hydroxyl or alkyl C_1–C_4; R_2 is hydrogen, alkyl C_1–C_4 or alkoxy C_1–C_4; R_3 is hydrogen, alkyl C_1–C_4, alkoxy C_1–C_4,



R_5 is hydrogen or n-alkyl C_1–C_4; R_6 and R_7 are hydrogen or alkyl C_1–C_4; R_8 and R_9 are hydrogen, alkyl C_1–C_4 or halogen; and A is hydrogen, ahlogen or alkyl C_1–C_4; provided that A and —O—CO—NHR₄ are meta- and para-, respectively, or para- or meta-, respectively; and provided that R_2 is hydrogen when R_3 is either



3,954,442
HERBICIDAL COMPOSITIONS

Werner Becker, Frankfurt am Main; Peter Langeluddeke, Diedenbergen, Taunus; Heinrich Leditschke, Frankfurt am Main; Helmut Nahm, and Friedhelm Schwerdtle, both of Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

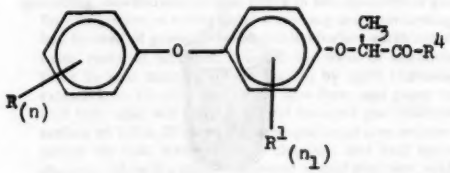
Filed May 11, 1973, Ser. No. 359,274

Claims priority, application Germany, May 17, 1972, 2223894

Int. Cl.² A01N 9/24

U.S. Cl. 71—108 **9 Claims**

1. A method for combatting weed grasses in plantings of cereal and dicotylendenous crops which comprises applying to the planting site an effective concentration of a herbicidal composition containing as the active ingredient from about 2 to about 95 percent of a compound of the formula



in which R represents identical or different substituents selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, or methoxy; R^1 represents identical or different substituents selected from the group consisting of hydrogen, halogen, or methyl; n and n_1 stand for integers from 1 to 3; and R^4 represents hyroxyl, —O-alkyl having 1 to 10 carbon atoms, —O-alkenyl having 2 to 4 carbon atoms, —O-cyclohexyl, —O-methylcyclohexyl, —O-cyclopentyl, phenoxy, phenoxy substituted once or twice with halogen, —O-benzyl, or —O-cat. wherein cat. stands for the cation of an inorganic or organic base, the balance being an inert herbicidal carrier.

3,954,443
ALUMINUM PROCESS

Marcellan F. Gautreaux; John H. McCarthy; Walter E. Foster; Donald O. Hutchinson, and Frederick W. Frey, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 277,383, Aug. 2, 1972, Pat. No. 3,860,415. This application July 1, 1974, Ser. No. 484,397

Int. Cl.² C22B 1/08, 21/02

U.S. Cl. 75—3 **19 Claims**

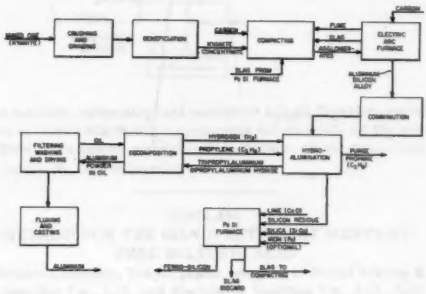
1. A process for producing substantially pure aluminum from a raw kyanite ore, comprising, in sequence, the steps of:

a. comminuting the raw kyanite ore into particles about minus 35 mesh in size, then beneficiating the ore particles via flotation to remove micas, pyrites and quartz sand, and then magnetically separating the iron containing minerals from the product to form a particulated kyanite concentrate;

b. agglomerating the particulated kyanite concentrate into ore compactions of a predetermined size and shape;

c. carbothermically reducing the ore compactions in an electric arc furnace to produce an aluminumsilicon alloy, slag and effluent fume, and recycling said slag and effluent fume to the agglomerating step;

d. comminuting the aluminum-silicon alloy to a particle size of about minus 100 mesh;



e. subjecting the particulated aluminum-silicon alloy to hydroalumination with propylene, hydrogen and a sodium catalyst to form tripropylaluminum and dipropylaluminum hydride and silicon residue; separating said aluminum alkyls and said silicon residue; heating said silicon residue in a furnace with calcium oxide, silicon dioxide and iron as needed to produce a ferrosilicon alloy of a desired ratio of silicon and iron and a quantity of slag; and separating the ferro-silicon alloy from the slag and casting it into a desired shape; and,

f. pyrolyzing the mixture of tripropylaluminum and dipropylaluminum hydride in an inert diluent to produce substantially pure aluminum powder, propylene and hydrogen; recovering the propylene and hydrogen and transferring them to the hydroaluminating step.

3,954,444
PROCESS FOR THE DIRECT REDUCTION OF IRON ORES

Werner Wenzel, Aachen; Peter Speich, Cologne; Friedrich H. Franke, and Burkhardt Dreyer, both of Aachen, all of Germany, assignors to Rheinische Braunkohlenwerke AG, Cologne and Werner Wenzel, Aachen, both of, Germany

Filed Feb. 15, 1974, Ser. No. 442,987

Claims priority, application Germany, Feb. 17, 1973, 2307924

Int. Cl.² C21B 5/06

U.S. Cl. 75—42 **8 Claims**

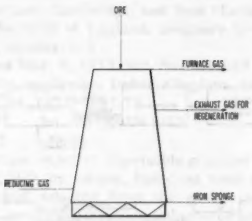
1. A process for the direct reduction of iron ores using a reducing gas mixture which is passed through a furnace having a shaft containing ore in substantially the following stages arranged in the direction of gas flow from bottom to top: a first stage defined by a layer containing substantially Fe, a Wüstite

stage defined by a layer containing substantially FeO, a magnetite stage defined by a layer containing substantially Fe_3O_4, and a hematite stage defined by a layer containing substantially Fe_2O_3, said process comprising the following steps:

generating a reducing gas having a $CO:H_2$ ratio between 1.5:1 to 2.5:1 at a temperature between 1050° and 1450°C;

mixing the generated reducing gas with a regenerated gas to produce a reducing gas mixture;

introducing the reducing gas mixture in said first stage of the furnace;



removing a partial flow of the reducing gas mixture from the furnace at the transition between said magnetite and Wüstite stages;

regenerating the gas mixture removed from the furnace by washing to remove CO_2 and H_2O to produce a regenerated gas having a $CO:H_2$ ratio between 1.5:1 to 2.5:1; and

heating the regenerated gas to a temperature to approximately 900°C before mixing with the generated reducing gas.

3,954,445

METHOD OF CONTROLLING TEMPERATURE IN Q-BOP

Richard J. Fruehan, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 30, 1974, Ser. No. 501,914

Int. Cl.² C21C *7/00*

U.S. Cl. 75—51 **9 Claims**

1. A method of producing steel in a bottom-blown oxygen steelmaking vessel, the steps comprising:

a. forming a steelmaking heat within said vessel, said heat comprising a hot metal charge containing the usual impurities including carbon in an amount in excess of 0.3 percent and solid steel scrap in an amount of from 0 to 15 percent of the total heat formed;

b. simultaneously blowing oxygen and a protective jacket fluid surrounding the blown oxygen into the heat for a time sufficient to oxidize a substantial amount of the impurities from the heat;

c. during the above blowing step, injecting finely divided iron oxide into the heat in an amount within the range of 5 to 30 pounds of iron oxide per ton of metal in the heat, the iron oxide injected at a rate sufficient to add all the iron oxide to the heat before the carbon contnet of the heat is reduced to 0.3 percent; and

d. tapping said heat.

3,954,446

METHOD OF PRODUCING HIGH DUTY CAST IRON

Tadashi Miyaoka, Nishinomiya; Hiromu Tanimura, Fukuoka; Yoshio Tanaka, Takarazuka, and Susumu Togawa, Amagasaki, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Jan. 8, 1975, Ser. No. 539,314

Claims priority, application Japan, Feb. 23, 1974, 49-21669

Int. Cl.² C21C *7/02*; C22B *4/00*

U.S. Cl. 75—53 **11 Claims**

1. A method of producing high duty cast iron comprising heating molten pig iron to above the temperature at which SiO_2 will decompose in the presence of C, forming a slag on the surface of said molten pig iron by adding a refining agent consisting essentially of 10–90%CaO, 5–30% graphite, 5–20%Ca-Si and the balance CaC_2, allowing said refining agent to react in contact with said pig iron under said temperature condition, thereby de-oxidizing and de-sulphurizing said pig iron to produce refined iron.

3,954,447

PROCESS FOR THE PROTECTION OF A METAL INGOT AGAINST OXIDATION

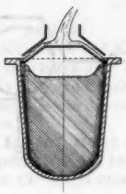
Guy Souchon, Cierp-Gaud, France, assignor to Societe Francaise D'Electrometallurgie, Paris, France

Filed June 3, 1974, Ser. No. 475,424

Claims priority, application Luxemburg, June 1, 1973, 67716

Int. Cl.² C22B *29/00*

U.S. Cl. 75—67 R **4 Claims**



1. A method to reduce the degree of oxidation of an ingot of a metal comprising magnesium obtained by a production or purification operation by converting the metal to a vapor state, condensing the vapor to the liquid form in a vessel the lower portion of which forms a crucible in which the liquid solidifies as an ingot with the formation of space by contraction between the ingot and the inner walls of the crucible, adding a fusable flux to the metal in the crucible with a view towards reducing the degree of oxidation, comprising causing a molten flux to flow into the said space between the crucible walls and the adjacent surfaces of the ingot and over the top of the ingot.

3,954,448

PROCESS FOR RECOVERING COBALT, COPPER, IRON, NICKEL AND ARSENIC

Sanai Nakabe, Yokohama, Japan, assignor to Sumitomo Metal Mining Co. Limited, Tokyo, Japan

Filed Jan. 28, 1975, Ser. No. 544,679

Int. Cl.² C22B *1/06, 23/04, 15/00*

U.S. Cl. 75—82 **15 Claims**

1. A process for recovering cobalt from cobaltiferous material comprising reducing-smelting an oxidized material rich in iron to extract cobalt as an alloy through reduction of oxidized cobalt into metal in preference to oxidized iron; converting the cobalt and iron in the alloy into sulfates by treating the alloy with cupric sulfate and water; calcining the resulting mixture containing the sulfates to decompose the iron sulfate selectively into oxide, and leaching the resulting calcine with an aqueous medium to extract cobalt as a cobalt sulfate solution leaving iron as a leach residue.

3,954,449
PROCESS FOR THE RECOVERY OF NOBLE METALS

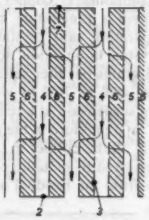
Hermann Rudorfer; Anton Wagner; Franz Prammer, all of Linz, and Friedrich Klausner, Pasching, all of Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed July 11, 1974, Ser. No. 487,803

Claims priority, application Germany, July 13, 1973, 2335712

Int. Cl.² C22B *11/02*

U.S. Cl. 75—83 **2 Claims**



1. A process for the recovery of a noble metal which has volatilised or become detached in a very finely divided state from the surface of a noble metal catalyst gauze in an exothermic reaction of a gaseous mixture, preferably a mixture of ammonia and air to form nitrous gases, carried out under an excess pressure of at least one atmosphere gauge, said process comprising:

providing, downstream of said gauze in the direction of gas flow therefrom, a noble metal absorbing and intercepting bed formed of granular acid-soluble alkaline earth metal oxide material, said bed being in the form of channels filled by said material and separated by open channels extending in the direction of gas flow from said gauze to said bed, said bed having a total external gas incident surface of 1.5 to 20 times the cross-sectional area encompassed by said material filled channels and said open channels taken in a plane transverse to said direction, said bed being maintained at a temperature of from about 600° to 900°C;

passing the gaseous reaction mixture, after having passed the noble metal catalyst gauze, in said direction into a portion of said open channels;

then directing said gaseous reaction mixture transverse to said direction through said material filled channels, thereby removing noble metal from said gaseous reaction mixture, and into the remainder of said open channels, said material filled channels having a thickness in the direction of gaseous flow therethrough of 20 to 40 mm; and

thereafter, when the intercepting action of said material of said bed has been exhausted, recovering the noble metal removed by said bed by dissolving said material in acid.

3,954,450
RECOVERY OF LEAD, ZINC AND IRON SULFIDE

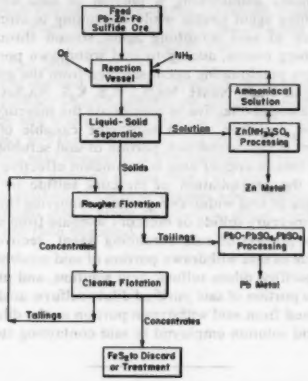
Martin C. Kuhn, and Nathaniel Arbiter, both of Tucson, Ariz., assignors to The Anaconda Company, New York, N.Y.

Filed Mar. 26, 1975, Ser. No. 562,393

Int. Cl.² C22B *13/04, 19/26*

U.S. Cl. 75—103 **10 Claims**

1. The method of recovering lead from a finely divided sulfidic lead-bearing mineral concentrate containing iron sulfide which comprises forming a slurry of said mineral in an aqueous medium containing ammonium sulfate and free ammonia, introducing such slurry into a closed reaction vessel at a pressure not exceeding 30 psig, introducing oxygen into such vessel to establish therein an oxygen partial pressure of at least several psi while vigorously agitating the slurry, whereby the sulfidic lead content of the mineral is substantially oxidized to the form of substantially water-insoluble oxidic lead compounds, subsequently withdrawing the slurry from the reaction vessel and separating the insoluble residue from the aqueous solution, subjecting said residue to a froth flotation operation to form a concentrate containing substantially all the iron sulfide and a tailing containing substantially all the oxidic lead compounds, and recovering said tailing.



3,954,451
METHOD FOR THE MANUFACTURE OF MERCURY FREE SULFURIC ACID

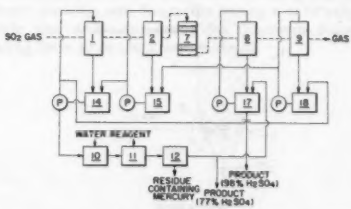
Hisahiro Kinoshita, Tokyo, Japan, assignor to Mitsui Mining & Smelting Co., Ltd. and Hachinohe Smelting Co., Ltd., both of Tokyo, Japan

Filed Sept. 6, 1972, Ser. No. 286,712

Claims priority, application Japan, Sept. 10, 1971, 46-70625; Feb. 28, 1972, 47-20820; Feb. 29, 1972, 47-21384; Apr. 24, 1972, 47-41633

Int. Cl.² C22B *43/00*; C01B *17/90*

U.S. Cl. 75—108 **8 Claims**



1. In a method of manufacturing substantially mercury-free sulfuric acid, by roasting non-ferrous metal sulfide material and then removing dust, cooling, washing and removing mist from the roasted gas to prepare a cool feed gas containing SO_2 and impurities comprising water and mercury converting the SO_2 to SO_3 and absorbing the SO_3 in dilute sulfuric acid, the improvement which comprises the steps of:

continuously flowing a stream of said feed gas into and through scrubbing means and therein continuously scrubbing said feed gas with a continuously circulating stream of liquid scrubbing agent consisting essentially of sulfuric acid solution having an H_2SO_4 concentration of from 77 to 99 wt. % and having a temperature of from 20° to 70° C, to absorb impurities comprising water and mercury present in said feed gas into said scrubbing agent and to produce a stream of purified feed gas containing SO_2;

converting the SO_2 in said purified feed gas to SO_3 and then flowing said resultant SO_3-containing gas through absorption

tower means and therein contacting said resultant gas with dilute sulfuric acid solution to absorb the SO_3 whereby to produce concentrated sulfuric acid solution;

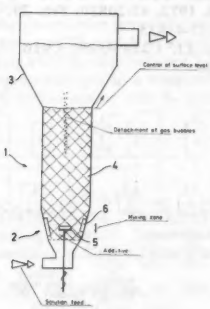
continuously withdrawing a portion of said circulating scrubbing agent stream while continuing to circulate the balance of said scrubbing agent stream through said scrubbing means, adding to said withdrawn portion one or more precipitating agent selected from the group consisting of Na_2S, NaSH, Na_2S_x, H_2S, K_2S, Na_2SeO_4 and S, in an amount effective to precipitate the mercury present therein, together with a substance capable of making present in said withdrawn portion of said scrubbing agent silver ions or copper ions in an amount effective to accelerate the precipitation of mercury sulfide or mercury selenide in said withdrawn portion, removing the precipitated mercury sulfide or mercury selenide from said withdrawn portion of said scrubbing agent, recovering the balance of said withdrawn portion of said scrubbing agent as a purified dilute sulfuric acid solution, and utilizing at least a portion of said purified dilute sulfuric acid solution obtained from said withdrawn portion as the dilute sulfuric acid solution employed in said contacting step.

3,954,452

PROCESS FOR SEPARATING CD FROM ZN BY CEMENTATION

Valto Johannes Makitalo; Launo Leo Lilja, both of Pori, and Sigmund Peder Fugleberg, Kokkola, all of Finland, assignors to Outokumpu-Oy, Helsinki, Finland

Filed Feb. 25, 1974, Ser. No. 445,078
Claims priority, application Finland, Feb. 26, 1973, 573/73
Int. Cl.[2] C22B *17/04, 3/02*
U.S. Cl. 75—109 5 Claims



1. A process for separating from each other cadmium and zinc dissolved in water, by means of zinc as a cementation agent, in the presence of substantial amounts only of such materials as have a hydrogen overpotential greater than the potential difference between zinc and hydrogen gas; which comprises feeding a water solution containing cadmium and zinc into a reaction zone through a bed containing said cementation agent, crushing agglomerates produced in the cementation, and adding in to the reaction zone a high molecular weight polyacrylamide flocculation agent to cement cadmium in the form of smooth-surfaced particles which do not adhere to each other and from which particles gas bubbles are easily detached.

3,954,453

RECOVERY OF COPPER FROM AMMONIACAL COPPER SULFATE SOLUTION

Luis de la Pena Porth; Luis Espinosa de Leon; Raymundo Delgado, and Tomas Perez, all of Cantil No. 136, Mexico City 20, Mexico

Filed July 24, 1974, Ser. No. 491,454
Claims priority, application Mexico, Sept. 25, 1973, 146375
Int. Cl.[2] C22B *15/12*
U.S. Cl. 75—117 7 Claims

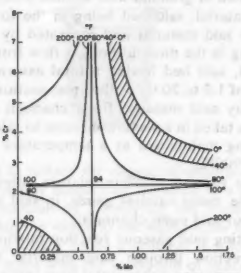
1. The method of producing metallic copper which comprises treating an ammoniacal copper sulfate solution with sulfur dioxide to form a precipitate of copper ammonium sulfite crystals, separating said crystals from the solution, suspending such crystals in an acidic solution containing initially from 20 to 75 grams per liter sulfuric acid, said suspension containing from 40% to 70% by weight of such crystals, heating the resulting suspension at a temperature in the range from 140° to 170°C. at a pressure in the range from 150 to 220 psi until substantially all the copper in the copper ammonium sulfite has been converted to metallic copper, and separating the metallic copper from the residual solution.

3,954,454

TEMPER EMBRITTLEMENT FREE LOW ALLOY STEEL

Bevil J. Shaw, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 9, 1975, Ser. No. 566,490
Int. Cl.[2] C22C *38/22, 38/44*
U.S. Cl. 75—123 J 5 Claims



1. A rotor steel which is substantially free of temper embrittlement within given constraints consisting essentially of from about 0.18% to about 0.25% by weight of carbon, not in excess of about 0.030% by weight of sulfur, manganese not in excess of 2 times the sulfur content on an atomic basis, silicon as low as practical commensurate with the overall economics in producing the steel, phosphorus not in excess of 200 ppm on a weight basis, nickel up to about 4% by weight, up to about 7% chromium, up to about 1.75% molybdenum, the chromium and molybdenum being balanced in accordance with the shaded portion of FIGS. 1 and 2 of the accompanying diagram, at least one carbide forming element selected from the group of up to about 0.1% vanadium, up to about 0.1% tungsten, up to about 0.1% niobium, up to about 0.1% tantalum and mixtures thereof, as low as possible amounts of tramp elements tin, arsenic and antimony and the balance essentially iron with incidental impurities, the alloying elements being balanced to provide a predetermined $FATT_{UE}$ in °F in accordance with the equation:

$$FATT_{UE}(°F) = 5.53 - 202.6(\%Mo) - 24.8(\%Cr) - 45.2(\%Ni) - 3729(\%P) - 3893(\%Sn) + 1645(\%CrP) + 1526(\%CrSn) + 1337(\%NiP) + 1123(\%NiSn) + 105.2(\%Mo)^2$$

and the elements are further balanced to provide a ΔFATT = ± 40°F in accordance with the equation:

$$\Delta FATT = -71.15 + 198.3(\%Mo) + 52.7(\%Cr) + 1.1(\%Ni) + 1610(\%P) - 5889(\%Sn) - 80.6(\%MoCr) + 1772(\%NiSn) + 182800(\%PSn).$$

3,954,455

LIQUID-SOLID ALLOY COMPOSITION

Merton C. Flemings, Lexington; Robert Mehrabian, Arlington, and David B. Spencer, Bedford, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 379,991, July 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 258,383, May 31, 1972, abandoned, which is a continuation-in-part of Ser. No. 153,819, June 16, 1971, abandoned. This application May 20, 1974, Ser. No. 471,324

Int. Cl.² C22C *23/00, 18/00, 33/00*

U.S. Cl. 75—134 R **21 Claims**

1. A metal composition which, when frozen from a liquid state without agitation forms a dendritic structure, said composition containing discrete degenerate dendritic primary solid particles in a concentration of up to 65 percent by weight based upon said composition, said primary solid particles being derived from the composition and being homogeneously suspended in a secondary phase, said secondary phase being derived from the composition and having a lower melting point than said primary solid particles.

3,954,456

ELECTRICAL CONTACT MATERIALS AND METHODS OF MAKING THE SAME

Terrence Ardern Davies, Horton, England, assignor to Square D Company, Park Ridge, Ill.

Division of Ser. No. 384,157, July 30, 1973, Pat. No. 3,857,706. This application Nov. 25, 1974, Ser. No. 526,564

Claims priority, application United Kingdom, Aug. 25, 1972, 39666/72

Int. Cl.² C22C *1/03*

U.S. Cl. 75—135 **1 Claim**

1. A method of producing an electrical contact material which includes the steps of providing silver and tellurium powder; mixing the silver and tellurium powders together to provide a mixture containing not more than 3.0 weight per cent of tellurium; melting the silver-tellurium powder mixture under an inert atmosphere to provide a molten alloy; providing a silver-mercury master alloy; adding the master alloy to the molten silver-tellurium alloy under the inert atmosphere to provide a molten silver-tellurium-mercury alloy containing not more than 3.0 weight per cent of mercury and tellurium; casting the silver-tellurium-mercury alloy to form an ingot; and forging and rolling the ingot into sheet form.

3,954,457

DENTAL AMALGAM

Gary Maurice Weikel, 1050 Greenfield Drive, El Cajon, Calif. 92021

Filed Apr. 28, 1975, Ser. No. 572,567

Int. Cl.² C22C *7/00*

U.S. Cl. 75—169 **5 Claims**

1. A dental amalgam consisting essentially of:

a. a conventional silver base alloy consisting essentially of approximately 65% Ag, 29% Sn, up to 6% Cu and up to 2% Zn;

b. and mixed with (a) an additive in particle form selected from the group consisting of elemental copper and copper base alloys; and

c. mercury to form an amalgam with (a).

3,954,458

DEGASSING POWDER METALLURGICAL PRODUCTS

Sidney G. Roberts, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Nov. 12, 1973, Ser. No. 414,658

Int. Cl.² B22F *1/00*

U.S. Cl. 75—200 **12 Claims**

1. In the method of forming products from prealloyed aluminum powder wherein prealloyed aluminum powder having a particle size less than 100 mesh is degassed, compacted to full density and then hot worked, the improvement comprising conducting said degassing at a temperature between 450° and 850° and at a pressure of less than 10^{-3} torr.

9. The method of claim 6 wherein said prealloyed powder is compacted into a green compact to about 50–85% of full density and then degassed.

3,954,459

METHOD FOR MAKING SINTERED SILVER-METAL OXIDE ELECTRIC CONTACT MATERIAL

Horst Schreiner, and Bernhard Rothkegel, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 27, 1973, Ser. No. 419,234

Claims priority, application Germany, Dec. 11, 1972, 2260559

Int. Cl.² B22F *1/00*

U.S. Cl. 75—206 **3 Claims**

1. A method for making sintered silver-metal oxide electric contact material, comprising atomizing a molten alloy of silver and non-noble metal into particles of which a fraction is of smaller particle size and another fraction is of larger particle size as the fractions are compared with each other, separating the fraction of particles of larger particle size from the fraction of particles of smaller particle size, internally oxidizing the particles of the separated fraction of larger particle size to form internally oxidized particles, breaking the internally oxidized particles into fragments having a relatively smaller particle size, and compressing the fragments together and sintering them to produce said material.

3,954,460

METHOD OF SINTER COATING METAL STRIPS WITH METALLIC POWDER USING FATTY ACID AMIDE AS A TEMPORARY ADHESIVE

Richard A. Nickola, Highland, Ind., assignor to Inland Steel Company, Chicago, Ill.

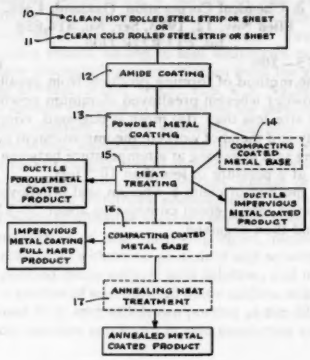
Continuation-in-part of Ser. No. 300,171, Oct. 24, 1972, abandoned. This application June 6, 1973, Ser. No. 367,558

Int. Cl.² B22F *7/00*

U.S. Cl. 75—208 CS **13 Claims**

1. A process of forming on a metal strip an adherent coating of a finely divided metallic material which forms a sinter coating at a temperature below the melting point of the metal strip comprising; applying to a clean surface of said metal strip a film of a fatty acid amide having a carbon chain length between about 8 and 18 carbon atoms and a melting point between about 150°F and 270°F, depositing a finely divided metallic material on said film to effect forming a suspension of said finely divided metallic material in said film while said film remains molten, and heating said metal strip in a reducing

non-oxidizing atmosphere at a temperature which effects bonding between said finely divided metallic material and said



metal strip to form an adherent ductile metallic coating on said strip.

3,954,461

PROCESS FOR THE PRODUCTION OF LOW APPARENT DENSITY WATER ATOMIZED STEEL POWDERS

Heng-Chi Chao; John H. Gross, both of Monroeville Borough; Robert R. Judd, Washington Township, Westmoreland County, and Roger L. Rueckl, Franklin Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 389,603, Aug. 16, 1973. This application Feb. 11, 1974, Ser. No. 441,609

Int. Cl.[2] B22F *1/00*

U.S. Cl. 75—213 **4 Claims**

1. A method for the production of molding grade steel powders with low apparent densities, which comprises,

a. providing as-water-atomized steel particles with a prescribed size distribution, wherein at least 80% of said particles are finer than 80 mesh and said distribution exhibits a PSC value of between 1.0 to 2.7,

b. annealing said particles at a temperature within the range of 1400°-2100°F for a time at least sufficient to (i) effect the desired softening thereof, and (ii) reduce the oxygen content thereof to a value below about 0.2 weight percent, said annealing causing said particles to sinter together,

c. feeding the annealed, sintered particles to a disk mill operated at a speed of between about 200 to 5000 revolutions per minute and a mill gap of between about 0.01 to 0.10 inches, wherein the linear speed v of said disks is sufficiently low and the mill gap G is sufficiently large to grind said cake to molding grade powders with an apparent density of less than 2.6 gm/cc, substantially all of which are finer than 80 mesh.

3,954,462

ELECTROLYTICALLY INDUCED POLYMERIZATION UTILIZING DIAZOTIZATION OF PRIMARY AROMATIC AMINES

Steven Levinos, Chatham, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Apr. 7, 1972, Ser. No. 242,141

Int. Cl.[2] G03G *17/00*; C25D *1/00, 1/18*

U.S. Cl. 96—1 R **5 Claims**

1. A method of polymerizing a polymerizable ethylenically unsaturated compound which comprises:

a. providing a combination, in an alkaline medium, of said compound with a polymerization catalyst precursor comprising a mixture of:

1. an alkali metal nitrite; and

2. a compound selected from the group consisting of diazotizable primary aromatic amines and compounds capable of yielding said amines upon electrolysis;

b. arranging said combination of polymerizable compound and catalyst precursor in intimate contact with the respective anode and cathode of an electrolytic circuit; and

c. subjecting said combination to the passage of an electrical circuit, thereby electrolyzing said polymerization catalyst precursor, whereby electrolysis of said catalyst precursor results in the diazotization of said primary aromatic amine at said anode with subsequent generation of polymerization-inducing catalyst species by electrolysis of diazotized amine in close proximity to said anode.

4. A method of forming an image which comprises:

a. providing imaging material comprising an electrically conductive support having a coating thereon of a layer of polymerizable composition comprising, in an alkaline medium:

1. a polymerizable ethylenically unsaturated compound,

2. an alkali metal nitrite, and

3. a compound selected from the group consisting of diazotizable primary aromatic amines and compounds capable of yielding said amines upon electrolysis;

b. contacting the exposed surface of said layer with a cathode exhibiting a pattern of electrical conductivity corresponding to said image;

c. arranging a source of electrical potential in circuit with said cathode and said electrically conductive support, said support constituting the anode of the arrangement;

d. causing electrical current to flow through said layer in accordance with the image pattern of conductivity of said cathode, thereby effecting imagewise diazotization of said amine and generation of polymerization-inducing species in said composition layer with concurrent polymerization of said polymerizable compound;

e. separating said cathode from said composition layer; and

f. removing unpolymerized composition from said layer.

5. An imaging method according to claim 4 wherein said cathode comprises a layer of a photoconductor compound and said image pattern of electrical conductivity is formed in said cathode by an imagewise light exposure of said photoconductor layer.

3,954,463

METHOD FOR ELECTROSTATIC PRINTING

Gopal C. Bhagat, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 110,220, Jan. 27, 1971, abandoned, which is a division of Ser. No. 744,183, July 11, 1968, Pat. No. 3,615,128. This application June 24, 1974, Ser. No. 482,737

Int. Cl.[2] G03G *13/14*

U.S. Cl. 96—1.4 **3 Claims**

1. A continuous method of making reproductions of an original electrostatically with a plate having a uniformly charged photosensitive surface, the steps comprising:

a. orienting the plate in a substantially flat condition;

b. flash exposing the photosensitive surface of the plate while in the flat condition to an optical pattern conforming to the original thereby forming a latent electrostatic image on the plate which conforms to the original;

c. conveying the plate through a developing station adapted to deposit insulating toner on the exposed surface in conformance with the latent image thereon;

d. then, from the developing station conveying the plate directly to a fixing station adapted to permanently affix the toner deposited on the plate;

e. then from the fixing station, conveying the plate bearing the affixed toner directly and without interruption into a circular path of movement through the following stations to reform the image in correspondence to the toner image fixed thereon:

i. a charging station adapted to place a uniform electrostatic charge on the photosensitive surface of the plate,

ii. an illuminating station adapted to illuminate the photosensitive surface of the plate thereby dissipating the electrostatic charge in all areas of the plate except in the areas having toner affixed to them, the electrostatic charge in the areas of the plate having toner affixed to them remaining relatively undissipated, and

iii. a developing station whereby insulating toner that is deposited on the plate adheres only to the areas of the plate having an undissipated electrostatic charge;

f. then conveying the plate bearing the reformed image to a transfer station to transfer the unfused toner from the surface of the plate to transfer material to make a copy; and

g. repeating steps e and f the number of times equal to the number of copies desired.

3,954,464
METHOD OF FABRICATING A COMPOSITE TRIGONAL SELENIUM PHOTORECEPTOR

Ronald E. Karam, Webster, and Richard P. Millonzi, Marion, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,859
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 **5 Claims**

1. A method of making a photosensitive imaging device which comprises;

a. forming a layer of electrically active organic material on a supporting substrate, (b) vacuum depositing a layer consisting essentially of vitreous selenium over said electrically active layer to a thickness of from 0.03 to 0.8 micron, (c) forming a relatively thin layer of electrically active or insulating organic material over said vitreous selenium layer, followed by (d) heating said device to a temperature in the range of 125° to 210°C for 1 to 24 hours to convert the vitreous selenium to the crystalline trigonal form.

3,954,465
ELECTROPHORETIC IMAGING MEMBERS

John B. Wells, Savannah; Paul C. Swanton, Webster; John W. Weigl, West Webster, and Edward Forest, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 290,618, Sept. 20, 1972, Pat. No. 3,850,627, which is a continuation of Ser. No. 104,389, Jan. 6, 1971, abandoned. This application Aug. 19, 1974, Ser. No. 498,694
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 **6 Claims**

1. An imaging member comprising a transparent conductive substrate carrying a photoconductive insulating material layer having a thickness of up to about 5 microns which carries a layer of a material capable of transporting at least one species of charge carrier which in turn carries a layer of a suspension comprising particles in an electrically insulating liquid.

3,954,466
ELECTROSTATOGRAPHIC PHOTORECEPTOR

Charles L. Beatty, Brighton; Nero R. Lindblad, Palmyra, and Henry R. Till, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 2, 1975, Ser. No. 538,041
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 **11 Claims**

1. In combination with an electrostatographic photoreceptor comprised of a conductive substrate having a layer on its surface of a photoconductive material in operative connection with the substrate, said photoreceptor being suitable for cleaning by the application of a thin edged doctor blade to its surface while maintaining relative motion therebetween, the improvement which comprises a plurality of abrasion resistant particles partially embedded in the layer of photoconductive material so that generally hemispherical portions of the particles protrude above the surface of the photoconductive material, said protruding portions being further defined in that they protrude to a distance of from about 0.5 to about 5 microns above the surface of the photoreceptor and are distributed so that less than 50 percent of the photoreceptor surface is covered by the protruding portions with the minimum distance between their perpheries being about 2 diameters of the protruding portion and the maximum average distance between their perpheries being no greater than the contact width of the doctor blade.

7. The improved photoreceptor of claim 1 wherein the embedded particles are made of an inorganic material selected from the group of silica or glass.

11. The improved photoreceptor of claim 1 wherein the photoconductive material is amorphous selenium.

3,954,467
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Masaaki Takimoto; Satoru Honjo, and Yasuo Tamai, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 29, 1971, Ser. No. 194,038
Claims priority, application Japan, Oct. 31, 1970, 45-96221
Int. Cl.² G03G 5/08
U.S. Cl. 96—1.7 **5 Claims**

1. An electrophotographic photosensitive material having an electrophotosensitive layer comprising a finely-divided inorganic photoconductive material, a sensitizing dye for said photoconductive material and a resinous binder having an acid component with an aromatic nucleus on a support which comprises said resinous binder being crosslinked with polyisocyanate to be rendered insoluble in an organic solvent.

3,954,468
RADIATION PROCESS FOR PRODUCING COLORED PHOTOPOLYMER SYSTEMS

James Marvin Lewis, Aurora, and Raymond Willis Newyear, Willoughby, both of Ohio, assignors to Horizons Incorporated, Cleveland, Ohio

Filed Aug. 27, 1974, Ser. No. 500,931
Int. Cl.² G03C 5/00, 5/24, 7/00, 1/68
U.S. Cl. 96—33 **8 Claims**

1. A process which comprises:

I. providing a photosensitive composition consisting essentially of:

1. at least one photopolymerizable monomer selected from the group consisting of N-vinyl amines, N-vinyl amides, N-vinylimides, acrylamines and congeners of said monomers;

2. at least one iodine containing compound which produces free radicals on exposure to suitable radiation and which thereby activates the photopolymerization of said monomer, and which is selected from the group consisting of alkyl iodides, sulfenyl iodides and sulfonyl iodides;

3. at least one dye selected from the group consisting of:
   a. substituted anthraquinones
   b. binuclear merochanines
   c. complex merochanines
   d. cyanines
   e. 9-phenyl-fluoren-9-ols; and
4. a resin binder in which said constituents (1), (2), and (3) are dissolved to form a coating solution in which the several constituents are present in the following proportions by weight:

(a) photopolymerizable monomer	100 – 300
(b) organic iodine compound	15 – 300
(c) dye or image color compound	0.005 – 5
(d) resin binder	200 – 3000

all of the above being carried in solution in 3,000 to 10,000 parts by weight of a compatible solvent for the same:

II. wet coating a suitable, clean substrate with a layer of said solution between about 0.1 and 5.0 mils wet thickness;

III. drying the layer;

IV. subjecting said layer to an imagewise exposure of a dose or suitable radiation whereby said monomer photopolymerizes in the radiation affected areas; and

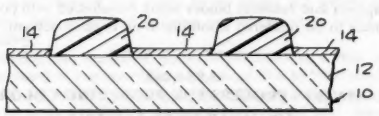
V. leaching any color present in the unexposed portion of said layer by contacting said layer with a solution of a strong acid, whereby as a result of said exposure, photopolymerization and leaching with strong acid, the dye becomes fixed to the polymer produced by photopolymerization of said monomer.

3,954,469

METHOD OF CREATING A REPLICATING MATRIX

Norma Abigania Avanzado, Redondo Beach; Manfred H. Jarsen, Encino, and Csaba K. Hunyar, Los Angeles, all of Calif., assignors to MCA Disco-Vision, Inc., Universal City, Calif.

Filed Oct. 1, 1973, Ser. No. 402,637
Int. Cl.² G03C *1/68, 5/16*
U.S. Cl. 96—35.1 **3 Claims**



1. The process of producing a replicating matrix from a master disc in which information is represented as a multiplicity of transparent and opaque areas over the surface of a transparent disc, comprising the steps of:

1. fastening the disc to a rotatable spindle with the information bearing surface outermost;
2. rotating the disc;
3. washing the rotating disc with xylene;
4. coating the disc with a premeasured quantity of photoresist to build a desired thickness of photoresist;
5. drying the photoresist coating for approximately 10 minutes;
6. removing the disc from the spindle;
7. baking the photoresist coating at a temperature of approximately 260° F. for approximately 15 minutes,

whereby the interim product produced can be exposed and developed into a replicating matrix.

3,954,470

PROCESS FOR FABRICATING A COLOR CATHODE RAY TUBE

J. Robert Barczynski, Waterloo; Milton L. Deffenbaugh, Columbus Grove; Melvin R. Hedrick, Ottawa, all of Ohio, and Jerry F. Janssen, Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 13, 1975, Ser. No. 557,966
Int. Cl.² G03C *5/00*
U.S. Cl. 96—36.1 **10 Claims**

1. An improvement in the process for fabricating the basic patterned windowed-web portion of a color cathode ray tube screen structure formed on the interior of a substantially concave glass face panel having a viewing area with an axis therethrough peripherally circumscribed by continuous skirt-like wall terminated by a sealing edge, said wall having a plurality of inwardly projecting mask positioning means spatially oriented therein, said basic patterned structure being an array of multitudinous window openings defined by an interstitial webbing formed on said viewing area by discreetly controlled exposure of the viewing area portion of a negative radiant-energy sensitive coating applied to the interior of said panel including said wall and said mask positioning means oriented therein, said exposure being effected by radiant energy projected from a predeterminately positioned primary emission means discretely directed through the openings of a proximally associated apertured mask member spatially oriented within said panel by said positioning means to provide a latent polymerized image in the coating defining the subsequent pattern windows covering the viewing area, whereupon said mask member is removed from said panel, said process improvement being additional procedures comprising:

positioning said panel in a manner to locate an areal internal shielding member within said coated panel at a location substantially intermediate the viewing area and said mask positioning means in a manner to protect the priorly formed latent imagery of the window pattern disposed thereon during subsequent exposure of said panel;

orienting at least one secondary emitter of radiant energy relative to said shielding member and the wall of said panel in a location to beam exposure radiation toward said sidewall;

exposing only that portion of the radiant energy sensitive coating disposed on the wall of said panel by a flood of radiant energy emanating from said secondary energy emission means in a manner substantially normal to the axis of said panel to provide a defined band of polymerized coating therearound;

removing said panel from said shielding member and said secondary emission means;

developing said diversely exposed area of coating on the interior of said panel to remove the unexposed portions thereby providing a pattern of polymerized window areas on said viewing portion and a polymerized band on said wall;

overcoating the interior of said panel with an opaque material; and

treating the interior of said panel with a degrading agent to loosen and remove therefrom the polymerized material along with the opaque material deposited thereon to provide the interstitially defined windowed webbing of the screen area circumscribed by a substantially bare glass sidewall wherein the mask positioning means are free of coatings.

3,954,471
PHOTOGRAPHIC FIXING PROCESS

Timothy Douglas Andrews; Glyn David Short, and Jan Willem Frederik van Ingen, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

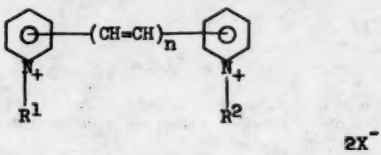
Continuation of Ser. No. 281,799, Aug. 18, 1972, abandoned. This application Sept. 12, 1974, Ser. No. 505,387

Claims priority, application United Kingdom, Aug. 19, 1971, 38934/71

Int. Cl.² G03C *5/24*

U.S. Cl. 96—48 R **7 Claims**

1. A method of forming an image, which comprises the steps of irradiating imagewise a photosensitive material containing a radiation sensitive salt of the general formula



where R^1 and R^2 are selected from the group consisting of alkyl, aryl, aralkyl, alkaryl and oxyhydrocarbyl groups, *n* is 0 or an integer and X^- is an anion whereby a reduction product is formed, and contacting the irradiated salt with a solution of a water soluble fixing agent capable of being reduced to a water-insoluble colored product by the said reduction product, said fixing agent being selected from the group consisting of tetrazolium salts, phthalocyanine dye precursors and ferricyanides, for a time sufficient for the formation of such colored product.

3,954,472
SUBTRACTIVE DEVELOPER FOR NEGATIVE WORKING LITHOGRAPHIC PLATES

John E. Walls, Ridgely, Md., assignor to S. O. Litho Corporation, Easton, Md.

Filed Aug. 26, 1974, Ser. No. 500,475

Int. Cl.² G03F *7/02;* **G03C** *5/34*

U.S. Cl. 96—49 **6 Claims**

1. A subtractive developer for negative working lithographic plates comprising a diazo resin photosensitive material on a substrate, said developer comprising an alcohol in the range of 10 – 90% by weight, ammonium sulfite in the range of 0.70 – 3.00% by weight, polyvinylpyrolidone in the range of 0.05 – 0.12% by weight, and distilled water for the balance by weight.

3,954,473
METHOD OF BLEACHING METALLIC SILVER

Ronald F. Lambert, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 24, 1974, Ser. No. 482,368

Int. Cl.² G03C *5/32, 5/38;* **C22B** *1 1/00*

U.S. Cl. 96—60 R **14 Claims**

1. A method of bleaching metallic silver present in a developed photosensitive silver halide element which comprises treating said metallic silver with an aliphatic tertiary organic phosphine in the presence of an electron acceptor selected from

3-nitrophthalic anhydride, 3-nitrophthalic acid, 2,5-dinitrobenzoic acid, 2,4-dinitrophenylacetic acid, 3-nitro-o-phthalic amide, mellitic acid, mellitic trianhydride, 2-hydroxyphenazine, benzoquinone, dichlorodicyano-p-benzoquinone, tetrachloro-p-benzoquinone, 2,6-dimethyl-p-benzoquinone, tetracyano-p-benzoquinone, pyrazine, p-phenylenediimine, 3,5-trifluoromethyl benzoic acid, and 3-carboxy-5-nitrobenzotrifluoride at a pH above 7, said phosphine and electron acceptor being used in equimolar proportions and in substantially excess proportions relative to the quantity of said metallic silver.

14. A method of bleaching metallic silver which comprises treating a deposit of metallic silver with an aliphatic tertiary organic phosphine in the presence of atmospheric oxygen at a pH above 7, said phosphine being used in substantially excess proportions relative to the quantity of said metallic silver and said treated deposit being maintained in the presence of atmospheric oxygen at least until bleaching is effected.

3,954,474
DEVELOPING METHOD

Akikazu Mikawa; Tadao Shishido, and Shoji Ishiguro, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 20, 1974, Ser. No. 499,096

Claims priority, application Japan, Aug. 20, 1973, 48-93699

Int. Cl.² G03C *5/30, 1/06, 1/34*

U.S. Cl. 96—66.5 **8 Claims**

1. The process for developing an imagewise exposed silver halide photosensitive material using a developer containing an aldehyde hardening agent at temperatures of not less than about 30°C, wherein a silver halide emulsion layer of the photosensitive material contains at least one heterocyclic compound having at least one nitrogen atom, having a thione group which does not undergo enolation positioned next to the nitrogen atom, and not having a nitro group as an anti-fogging agent wherein the heterocyclic compound is represented by the followng general formula:

wherein Q represents the non-metal atoms required for forming a 5- or 6-membered heterocyclic ring together with the-N-C-moiety and R represents an alkyl group, an aryl group, or a heterocyclic ring.

3,954,475
PHOTOSENSITIVE ELEMENTS CONTAINING CHROMOPHORE-SUBSTITUTED VINYL-HALOMETHYL-S-TRIAZINES

James A. Bonham, Pine Springs, and Panayotis C. Petrellis, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

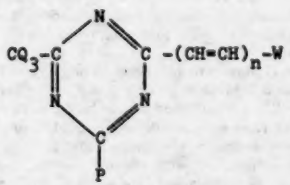
Division of Ser. No. 177,851, Sept. 3, 1971. This application Sept. 10, 1973, Ser. No. 395,419

Int. Cl.² G03C *1/76, 1/94, 1/68, 1/00*

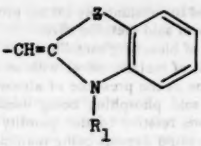
U.S. Cl. 96—67 **7 Claims**

1. A composition comprising:

1. an ethylenically unsaturated, freeradical initiated, chain propagating addition polymerizable compound and
2. a compound having the formula:



wherein Q is bromine or chlorine, P is $-CQ_3$, $-NH_2$, $-NHR$, $-NR_2$ or $-OR$ where R is phenyl or lower alkyl, *n* is an integer from 1 to 3 and W is an optionally substituted phenyl, pyrryl, benzopyrryl, oxazoyl, benzoxazoyl, benzthiazoyl or



where Z is oxygen or sulfur and R_1 is hydrogen, a lower alkyl or a phenyl group, said compound being capable of generating free radicals on stimulation by actinic radiation at a wavelength of about 330 to about 700 millimicrons.

3,954,476

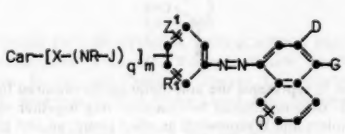
DIFFUSABLE DYE-RELEASING COMPOUNDS WHICH ARE CLEAVABLE UPON OXIDATION

James J. Krutak, Sr., Kingsport, Tenn.; Jan R. Haase, and Richard A. Landholm, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

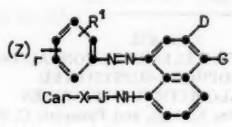
Filed Feb. 5, 1974, Ser. No. 439,809
Int. Cl.[2] G03C 3/00, 1/40, 7/00, 1/10
U.S. Cl. 96—73 83 Claims

1. A photosensitive element comprising a support having thereon at least one photosensitive silver halide emulsion layer and one of said layers having associated therewith a magenta image dye-providing compound having a formula as follows:

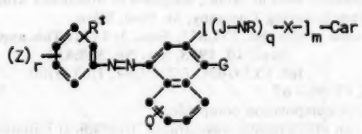
I.



II.



III.



wherein:

Car represents a ballasted carrier moiety which, as a function of oxidation of said compound under alkaline conditions, cleaves off from said compound releasing a diffusible dye;

m and *q* each represent an integer having a value of 0 or 1;

X represents a bivalent linking group of the formula —R^2—L_n—R^2_p— where each R^2 can be the same or different and each represents an alkylene radical having 1 to about 8 carbon atoms; a phenylene radical; or a phenylene radical substituted with chloro, bromo, cyano, nitro, methoxy, methyl, carboxy, or sulfo; L represents a bivalent radical selected from oxy, carbonyl, carboxamido, carbamoyl, sulfonamido, sulfamoyl, sulfinyl or sulfonyl; *n* is an integer having a value of 0 or 1; *p* is 1 when *n* equals 1 and *p* is 1 or 0 when n equals 0 or when q is 0, Car-X- may represent Car-alkylene-SO_2—, Car-$C_6H_4CH_2SO_2$—, or Car-phenylene-SO_2—, provided that the carbon content of X does not exceed 14 carbon atoms;

R represents a hydrogen atom, or an alkyl radical having 1 to about 6 carbon atoms;

J represents a bivalent radical selected from sulfonyl or carbonyl;

Q is in the 5- or 8-position relative to G and represents a hydroxy radical or a radical having the formula —NHCOR[3] or —$NHSO_2R^3$ wherein R^3 is an alkyl radical having 1 to about 6 carbon atoms, an alkyl radical having 1 to about 6 carbon atoms substituted with hydroxy, cyano, sulfamoyl, carboxy or sulfo; benzyl, phenyl, or a phenyl radical substituted with carboxy, cyano, chloro, methoxy, methyl or sulfamoyl;

G represents a hydroxy radical, a salt thereof, or a hydrolyzable acyloxy group having the formula:

wherein R^4 is an alkyl radical having 1 to about 18 carbon atoms, a phenyl radical or phenyl radical substituted with chloro or nitro;

r represents an integer having a value of 1 or 2;

Z represents a cyano radical, a trifluoromethyl radical, fluorosulfonyl, a carboxy radical, a carboxylic acid ester having the formula —$COOR^4$ wherein R^4 is as described previously, a nitro radical in the 2- or 3-position relative to the azo linkage, a fluoro, chloro or bromo atom, an alkylsulfonyl radical having 1 to 7 carbon atoms, alkylsulfonyl radical having 1 to about 8 carbon atoms substituted with hydroxy, phenyl, cyano, sulfamoyl, carboxy or sulfo; a phenylsulfonyl radical; a phenylsulfonyl radical substituted with sulfamoyl, carboxy, fluorosulfonyl or methoxy; an alkylcarbonyl having 2 to about 5 carbon atoms, a sulfamoyl radical having the formula —$SO_2NR^5R^6$ wherein R^5 represents hydrogen, an alkyl radical having 1 to about 8 carbon atoms; R^6 represents hydrogen, an alkyl radical having 1 to about 6 carbon atoms, an alkyl radical having 1 to about 6 carbon atoms substituted with hydroxy, cyano, fluorosulfonyl, carboxy or sulfo; a benzyl radical, a phenyl radical, a phenyl radical substituted with hydroxy, sulfonyl, sulfamoyl, carboxy or sulfo; an alkylcarbonyl having 2 to about 7 carbon atoms, phenylcarbonyl, an alkylsulfonyl having 1 to about 6 carbon atoms, alkylsulfonyl having 1 to about 6 carbon atoms substituted with cyano or hydroxy; phenylsulfonyl or methoxyphenylsulfonyl; or R^5 and R^6 taken together with the nitrogen atom to which they are bonded may represent morpholino or piperidino; a carbamoyl radical having the formula —$CON(R^5)_2$ wherein each R^5 can be the same or different and is as described previously;

Z^1 represents hydrogen or Z;

R^1 represents a hydrogen atom, an alkyl radical having 1 to about 4 carbon atoms, an alkyl radical having 1 to about 4 carbon atoms substituted with cyano, hydroxy or methoxy; an alkoxy radical having 1 to about 4 carbon atoms, or a halogen atom;

D represents a cyano radical, a sulfo radical, fluorosulfonyl, a halogen atom, a —SO_2-phenyl or a —SO_2-phenyl radical substituted with hydroxy, chloro, carboxy, sulfamoyl, methyl or methoxy; alkylsulfonyl radical having 1 to about 8 carbon atoms, an alkylsulfonyl radical having 1 to about 8 carbon atoms substituted with chloro, fluoro, hydroxy, phenyl, cyano, a phenylsulfonyl or phenylsulfonyl radical substituted with carboxy, fluorosulfonyl or methoxy; an alkylsulfinyl radical having 1 to about 8 carbon atoms or alkylsulfinyl radical having 1 to about 8 carbon atoms substituted with cyano, phenyl, hydroxy or sulfamoyl; a phenylsulfinyl radical or phenylsulfinyl radical substituted with sulfo or fluorosulfonyl; a sulfamoyl radical having the formula —$SO_2NR^5R^6$, a carbamoyl radical having the formula —$CON(R^5)_2$ wherein each R^5

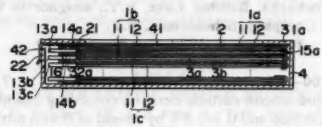
and R^6 is as described previously for Z, with the proviso that there be no more than one sulfo radical and no more than one carboxy radical present in said compound.

3,954,477

FILM UNIT ASSEMBLY

Masayuki Arisaka, and Hideo Horiuchi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 18, 1974, Ser. No. 489,651
Claims priority, application Japan, Aug. 6, 1973, 48-88195
Int. Cl.² G03C 1/48
U.S. Cl. 96—76 R 3 Claims



1. In a film unit assembly employing leaders for removal of successive exposed film units from a pack loaded in a camera, said pack including a front film exposure opening and a film unit discharge side slit to one side thereof through which film units move after exposure of the film unit stacked film units having photosensitive portions facing forwardly toward the object to be photographed for exposure through said front opening and removal laterally, in sequence, through said side slit, the improvement comprising: a film unit assembly wherein each said leader is made of a lightproof material having a leading and a trailing end, has dimensions at least sufficient to cover the photosensitive portions of a film unit, is attached at its leading end to the trailing end of a film unit, extends behind said film unit, and is attached at its trailing end to the leading end of the succeeding film unit, successive leaders being provided between successive film units, and wherein the trailing end of each leader is reversely bent and firmly bonded to the leading end of the succeeding film unit, whereby film units other than a foremost film unit are protected from light upon exposure of said foremost film unit, and removal of said foremost film unit from said pack causes said leader attached thereto to be drawn out of said pack and uncover the photosensitive portion of the next film unit, and with the trailing end being reversely bent where it is attached to the succeeding film unit, the trailing end portion thereof flattens with respect to the succeeding film unit to resist easy detachment from said succeeding film unit is drawn out of pack.

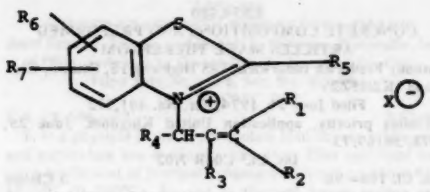
3,954,478

SILVER HALIDE EMULSION CONTAINING AN ALKENYL BENZOTHIAZOLIUM SALT AS STABILIZER

Naoki Arai, and Reiichi Ohi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 23, 1974, Ser. No. 535,659
Claims priority, application Japan, Dec. 21, 1973, 49-3114
Int. Cl.² G03C 1/34
U.S. Cl. 96—100 9 Claims

1. A silver halide light-sensitive material comprising a silver halide light-sensitive emulsion containing a compound represented by the following formula (I):



(I)

wherein R_1, R_2, R_3, R_4 and R_5 each represents a hydrogen atom or a lower alkyl group; and R_6 and R_7 each represents a hydrogen atom, a lower alkyl group, or a lower alkoxy group, or can combine to form a benzene ring and X^- represents an anion, in an amount effective to prevent fading of the silver halide latent image formed upon image-wise exposure of said silver halide light-sensitive emulsion.

3,954,479

HIGH-TEMPERATURE AND WEAR-RESISTANT ANTIFRICTION MATERIAL HAVING LOW THERMAL EXPANSIONS

Walter Jahn, Ingelheim, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Feb. 19, 1974, Ser. No. 443,512
Claims priority, application Germany, Feb. 19, 1973, 2308100
Int. Cl.² C03C 3/04
U.S. Cl. 106—52 13 Claims

1. A compact, self-supporting solid article of manufacture consisting essentially of high temperature and wear-resistant antifriction material of low thermal expansion in the form of a heterogeneous sintered article of a matrix of glass or glass ceramic of low thermal expansion and distributed substantially uniformly within the matrix small particles comprising at least one temperature and wear-resistant antifriction oxide selected from the group consisting of nickel oxide, cobalt oxide, ferric oxide, bismuth oxide and chromic oxide, said matrix having a thermal expansion of from -10 to $+50.10^{-7}$ per degree Celsius and comprising the following composition in percent by weight

SiO_2	40 – 80
Al_2O_3	0 – 40
B_2O_3	0 – 70
alkali metal oxides	2 – 20

3,954,480

CONCRETE COMPOSITIONS AND PREFORMED ARTICLES MADE THEREFROM

Anthony Frederick Inderwick, 185 Highway 15, Ottawa, Canada (K2H5Z2)

Filed June 21, 1974, Ser. No. 481,772

Claims priority, application United Kingdom, June 25, 1973, 30169/73

Int. Cl.[2] C04B 7/02

U.S. Cl. 106—90 3 Claims

1. A method of producing concrete articles, comprising:

a. forming an admixture of cement, aggregate, plasticizable powdered sulfur, a plasticizer for the sulfur and water, said admixture containing about 10 to 30% by weight of total cement plus sulfur based on the total composition with the ratio by weight of sulfur to cement being from about 1:4 to 4:1, about 1 to 5% by weight of the plasticizer based on the sulfur, and the water in an amount sufficient to hydrolize the cement but insufficient to saturate the admixture,

b. shaping the admixture into a desired shape,

c. compacting the shaped admixture,

d. allowing the compacted product to stand to permit partial or complete hydration of the cement therein,

e. heating the hydrated product to a temperature near or above the melting point of sulfur to plasticize the sulfur, and

f. thereafter cooling the resultant concrete article.

3,954,481

LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL CONTAINING A SUPERSENSITIZED SILVER HALIDE EMULSION LAYER

Hans Ohlschlager, Cologne, and Oskar Riester, Leverkusen, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

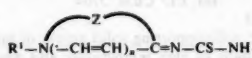
Filed Sept. 24, 1974, Ser. No. 508,755

Claims priority, application Germany, Sept. 28, 1973, 2348737

Int. Cl.[2] G03C 1/08

U.S. Cl. 96—122 3 Claims

1. Light sensitive photographic material containing at least one silver halide emulsion layer which has been spectrally sensitized with a merocyanine or a cationic cyanine dye characterised in that the silver halide emulsion layer in addition contains a heterocyclically substituted thiourea derivative of the following formula



wherein

R^1 represents a saturated or unsaturated aliphatic hydrocarbon group containing up to 6 carbon atoms or aryl,

R^2 represents

1. a saturated or unsaturated aliphatic hydrocarbon group containing up to 6 carbon atoms,
2. a cycloalkyl group or
3. an aryl group,

Z represents the ring members required to complete a heterocyclic ring selected from the group consisting of a thiazoline group, a thiazolidine group, a 1,2,4-thiadiazoline group and a 1,3,4-thiadiazoline group,

$n = 0$ or 1

said substituted thiourea being present in an effective amount to increase and stabilize the spectral sensitization.

3,954,482

CORROSION RESISTANT COATING MATERIAL AND METHOD

Robert Lee Novack, Medfield, Mass., assignor to High Performance Coatings, Inc., Newton Highlands, Mass.

Filed May 24, 1973, Ser. No. 363,613

Int. Cl.[2] C09D 5/10

U.S. Cl. 106—1 11 Claims

1. In a corrosion-resistant coating composition comprising a primer selected from the group consisting of organic and inorganic binders and metallic particles dispersed therethrough; the improvement comprising, as said particles, stainless steel planar flakes of thickness of the order of ⅛ of a micron and of surface dimensions largely of the order of 10 to 40 microns and in amounts of at least 1 pound per gallon of primer.

3,954,483

DENSE POLYCRYSTALLINE SILICON CARBIDE

Svante Prochazka, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 8, 1974, Ser. No. 431,729

Int. Cl.[2] C04B 35/52, 35/70

U.S. Cl. 106—44 7 Claims

5. A dense silicon carbide ceramic consisting essentially of β-silicon carbide and 0.7–3.5% by weight of boron nitride, the ceramic being substantially pore free, having a density of at least 98% of the theoretical density for silicon carbide, and having a maximum resistivity of about 50 ohm centimeters.

3,954,484

FLUOROPHOSPHATE GLASS AND PROCESS OF MAKING SAME

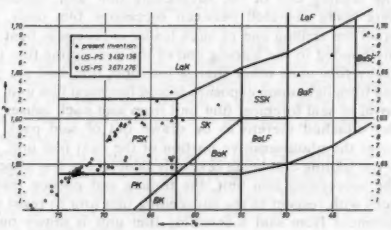
Heinz Broemer, Hermannstein, and Norbert Meinert, Bielhausen, both of Germany, assignors to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed Aug. 22, 1974, Ser. No. 499,661

Claims priority, application Germany, Aug. 23, 1973, 2342484

Int. Cl.[2] C03C 3/00

U.S. Cl. 106—47 Q 16 Claims



1. In a process of producing a fluorophosphate glass having an index of refraction n_e within the range of from about 1.5753 to about 1.6915, an Abbe number ν_e within the range of from about 41.2 to 69.7, and a relatively high positive anomalous partial dispersion, comprising the steps of

a. melting a mixture essentially consisting of the following components, in weight percent:

Fluoride component (a)

0.1% to 1.5% of magnesium fluoride MgF_2,

0.1% to 1.5% of calcium fluoride CaF_2,

0% to 15.0% of strontium fluoride SrF_2,

0% to 25.0% of barium fluoride BaF_2,

0% to 10.0% of aluminum fluoride AlF_3, and

0.1% to 1.5% of lanthanum fluoride LaF_3,

the total sum of the alkaline earth metal fluorides in said mixture not exceeding 38% and the total sum of all fluorides in said mixture not exceeding 45%.

Metaphosphate component (b)

8.0% to 12.0% of aluminum metaphosphate $Al(PO_3)_3$,

3.0% to 25.0% of magnesium metaphosphate $Mg(PO_3)_2$, and

10.0% to 18.0% of barium metaphosphate $Ba(PO_3)_2$,

the total sum of the metaphosphates in said mixture not exceeding 50%;

Barium oxide component (c)

8.0% to 55.0% of barium oxide BaO;

Additional oxide component (d)

0% to 17.0% of boron trioxide B_2O_3,

0% to 10.0% of germanium dioxide GeO_2,

0% to 4.0% of titanium dioxide TiO_2, and

0% to 20.0% of niobium pentoxide Nb_2O_5;

b. homogenizing the molten mixture at a temperature within the range of from about 1000°C. to about 1100°C. with stirring;

c. cooling said molten mixture to about 800°C.; and,

d. pouring said mixture into preheated molds.

3,954,485

SILVER-FREE POLARIZING PHOTOCHROMIC GLASSES

Thomas P. Seward, III, and Paul A. Tick, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,523

Int. Cl.² C03C *3/00*

U.S. Cl. 106—47 Q 9 Claims

1000Å

1. A method of making a photochromic glass article capable of reversibly changing from a clear, nonpolarizing state to a darkened, polarizing state which comprises the steps of:

a. providing a potentially photochromic glass article comprising, in weight percent, 40–75% SiO_2, 4–26% Al_2O_3, 4–26% B_2O_3, 4–30% total of at least one alkali metal oxide selected in amounts not exceeding the indicated proportions from the group consisting of up to 8% Li_2O, up to 15% Na_2O, up to 20% K_2O, up to 25% Rb_2O, and up to 30% Cs_2O, 0.1–10% total of at least one metal oxide selected from the group consisting of CuO and CdO, and 0.1–6% total of at least one halogen selected from the group consisting of Cl, Br, and I, the sum of these constituents totalling at least about 75% by weight of the glass;

b. heating the glass article to a temperature in the range of about 500°–900°C. for a time sufficient to cause the development therein of second-phase droplets having an average size in the range of about 100–1000A;

c. adjusting the temperature of the glass article to obtain a glass viscosity in the range of about 10^7–10^9 poises;

d. elongating the glass article to a length at which the second phase droplets therein exhibit aspect ratios in the range of about 2:1 to about 5:1; and

e. cooling the glass article to a temperature below the annealing point thereof.

3,954,486

SOLDER GLASS WITH REFRACTORY FILLER

Josef Francel, Toledo, and Robert F. Palermo, Waterville, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed July 30, 1974, Ser. No. 493,091

Int. Cl.² C03C *3/04*

U.S. Cl. 106—53 9 Claims

1. In a physical blend of particulate lead-borate solder glass and particulate low expansion refractory filler said filler having a coefficient of thermal expansion of less than about 65 × 10^{-7}/°C (0–300°C), for use in thermal fusion sealing to a workpiece having a lower coefficient of thermal expansion than said solder glass, the improvement wherein said refractory filler has a particle size diameter in excess of about 37 microns and not substantially in excess of 150 microns whereby the flow is increased and the coefficient of thermal contraction is decreased upon fusion sealing when compared to the flow and thermal contraction properties of a blend of the same composition which has a refractory filler particle size substantially less than 37 microns in diameter.

3,954,487

CHEMICALLY HARDENED SPECTACLE CROWN GLASS

Georg Gliemeroth, Mainz, and Lothar Meckel, Oestrich, both of Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Continuation of Ser. No. 330,008, Feb. 6, 1973, abandoned.

This application Oct. 15, 1974, Ser. No. 515,000

Claims priority, application Germany, Feb. 8, 1972, 2205844

Int. Cl.² C03C *3/04*

U.S. Cl. 106—54 10 Claims

1. A chemically hardened optical crown glass having a sharp U-form tension profile, a refractive index n_d of 1.5225–1.5235, a thermal expansion coefficient in the temperature range between 20° C. and 300° C. of 90 × 10^{-7} to 100 × 10^{-7}/° C., a dispersion νd of 54–60, a softening temperature of 690°–750° C., a transformation temperature of 480°–550° C., and a flexural tensile strength of at least 3000 kp/cm² produced by melting, shaping and cooling a batch consisting essentially of the following composition in parts by weight based on 100 parts of total composition wherein the sum of the alkali oxides in the composition amounts to 14.5–18.0% by weight, and wherein the sum of CaO, BaO and ZnO is larger than 6.3 and smaller than 10% by weight:

SiO_2	50.5	–	61.0
Al_2O_3	7.0	–	17.5
B_2O_3	2.0	–	6.1
Li_2O	0	–	1.0
Na_2O	12.0	–	15.0
K_2O	2.5	–	3.5
CaO	0	–	4.1
BaO	0	–	0.3
ZnO	5.0	–	10.0
PbO	0	–	0.5
TiO_2	0.1	–	0.9
As_2O_3	0	–	0.5
Sb_2O_3	0	–	1.0

and thereafter subjecting it to an ion exchange in which potassium, rubidium or cesium ions are diffused into the glass in exchange for smaller alkali metal ions at a temperature below the upper cooling temperature which corresponds to a viscosity of 10^{13} poises.

3,954,488

PLASTICALLY DEFORMABLE MAGNESIA

Richard L. Coatney, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 19, 1975, Ser. No. 559,947

Int. Cl.² C04B *35/04*, *35/44*

U.S. Cl. 106—62 9 Claims

1. A fired ceramic plastically deformable at 1500°C under stresses over 20,000 psi and consisting essentially of at least

98% MgO, less than 0.1% impurities other than CaO, SiO_2, and Al_2O_3, the remainder being subsidiary components which are CaO, SiO_2, and Al_2O_3, wherein the subsidiary components are about 65% CaO, from 25 to 33% SiO_2, and from 10% to 2% Al_2O_3, whereby the subsidiary phases are substantially all dicalcium silicate and tricalcium aluminate, all percentages being by weight and the percentages of CaO, SiO_2, and Al_2O_3 being based on the total weight of the subsidiary components.

3,954,489

METHOD FOR RETARDING THE SETTING TIME OF RAPID HARDENING CEMENT

Hiroshi Uchikawa, Funabashi, and Hajime Kato, Yokohama, both of Japan, assignors to Onoda Cement Company, Ltd., Yamaguchi, Japan

Filed Feb. 21, 1974, Ser. No. 444,650
Claims priority, application Japan, Feb. 21, 1973, 48-20266
Int. Cl.² C04B 7/02, 7/35
U.S. Cl. 106—89 11 Claims

1. A method for retarding the setting time of rapid hardening cement which comprises adding at least one boron compound selected from the group consisting of boric acid, boric acid anhydride and water soluble borates to cement manufactured by adding insoluble anhydrite ($CaSO_4$) to clinker which contains $11CaO.7Al_2O_3.CaX_2$ (X represents a halogen atom) and solid solutions of $3CaO.SiO_2$, $2CaO.SiO_2$ and $4CaO.Al_2O_3.Fe_2O_3$ as mineral components.

3,954,490

COATING COMPOSITIONS FOR GLASS FIBRES

David Ralph Cockram, Wigan, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed July 3, 1974, Ser. No. 485,659
Claims priority, application United Kingdom, July 3, 1973, 31657/73
Int. Cl.² C04B 7/02
U.S. Cl. 106—99 38 Claims

1. A cementitious product comprising cement and, as reinforcement, glass fibres coated with a composition which consists essentially of a protective material to reduce deterioration of the glass fibres, said protective material being a monocyclic or polycyclic aromatic compound which has at least three hydroxyl groups on the aromatic ring or when a polycyclic compound is employed, on at least one of the aromatic rings.

3,954,491

PROCESS FOR PRODUCTION OF RAW MIX CEMENT SLURRIES HAVING REDUCED WATER CONTENT

Norman F. Adrian, West Caldwell, and Joseph P. Fleming, East Brunswick, both of N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Oct. 21, 1974, Ser. No. 516,398
Int. Cl.² C04B 7/38, 7/42, 33/13
U.S. Cl. 106—100 4 Claims

1. A process for the production of an aqueous slurry of comminuted argillaceous limestone material, which upon burning produces cement, the process comprising admixing with the limestone material present in the slurry, an effective amount of a sodium naphthaleneformaldehyde sulfonate having a lowest elution volume of from about 61 to about 70% of a total elution volume by gel permeation chromatography to reduce the water content of the slurry and to conserve the amount of fuel required to evaporate water from the slurry during burning wherein the effective amount is from about 0.025 to about 0.1% solids by weight of sulfonate salt based on percent solids present in the slurry and is added to a slurry wherein the water content is from 20 to about 50% by weight based on the total slurry weight.

3,954,492

CALCIUM SULPHATE ANHYDRITE MORTAR

Karl Knauf, Iphofen, Germany, assignor to Gebruder Knauf West Deutsche Gipswerke, Ipohfen, Germany

Division of Ser. No. 319,393, Dec. 29, 1972. This application Sept. 13, 1974, Ser. No. 505,795
Claims priority, application United Kingdom, Jan. 3, 1972, 195/72
Int. Cl.² C04B 11/00; C01F 11/46
U.S. Cl. 106—109 7 Claims

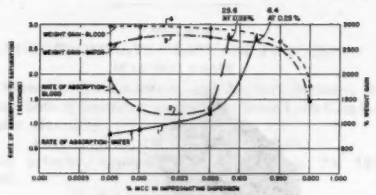
1. A mortar consisting essentially of particulate anhydrite and water, the weight ratio of water to anhydrite being from about 0.09 : 1 to about 0.12 : 1, wherein from about 2 to 6% by weight of the particles of particulate anhydrite have a particle size greater than about 5 mm, from about 13 to 23% by weight have a particle size of from about 5 to 3.15 mm, from about 33 to 40% by weight have a particle size of from about 3.15 to 1 mm, from about 17 to 23% by weight have a particle size of from about 1 to 0.2 mm, and from about 17 to 33% by weight have a particle size less than about 0.2 mm.

3,954,493

REGENERATED CELLULOSE SPONGE

Orlando A. Battista, and Richard L. Ward, both of Fort Worth, Tex., assignors to Avicon, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 299,131, Oct. 19, 1972, abandoned. This application May 20, 1974, Ser. No. 471,546
Int. Cl.² C08L 1/24
U.S. Cl. 106—127 6 Claims



1. A compressed regenerated cellulose sponge consisting essentially of regenerated cellulose and from about 0.15 to about 2.5% of a water-soluble or water-dispersible, high molecular weight, hydrophylic, film-forming polymer uniformly distributed throughout the sponge, the sponge being characterized in absorbing at least 25 times its weight of water and having a bulk density of at least 7 lbs./cu. ft. and, in contrast to a like regenerated cellulose sponge free of such film-forming polymer, exhibiting an increased liquid absorbency and, upon wetting, exhibiting a reduced lint formation along cut surfaces and, in contrast to a like regenerated cellulose sponge coated with such film-forming polymer, exhibiting an increased liquid absorbency.

3,954,494

WAX-FLUX COMPOSITION CONTAINING A SUCCINIMIDE SALT OF AN ALKYLARYL SULFONIC ACID FOR SOLDERING

Robert A. Stayner, Lafayette, and Warren Lowe, El Cerrito, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 30, 1974, Ser. No. 537,147
Int. Cl.² C08L 91/06
U.S. Cl. 106—270 12 Claims

1. A wax-flux composition for use in a low-temperature soldering process, comprising:

A. a major amount of a wax having an AMP between 40°C and 100°C; and

B. an amount effective to cause fluxing, at or below the soldering temperatures, of the piece to be soldered in said

process of a wax-soluble product obtained by first reacting a C_{20}–C_{400} aliphatic hydrocarbon-substituted succinic acid or a derivative thereof which is capable of forming carboximide bonds with a C_2–C_{30}, N_2–N_{10} alkylene polyamine to form a carboximide and then reacting said carboximide with a (C_8–C_{30} alkyl)aryl sulfonic acid.

3,954,495

PROCESS FOR THE PRODUCTION OF PIGMENTS USEFUL FOR WAXLESS CARBON PAPER

Günter Osswald, Hanau, and Hans Gräf, Rodenbach, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Feb. 28, 1975, Ser. No. 554,221

Claims priority, application Germany, Mar. 8, 1974, 2411104

Int. Cl.² C09C 1/48

U.S. Cl. 106—307 22 Claims

1. A process for the production of a pigment composition containing both carbon black and a blue pigment and a wetting agent comprising intensively mixing said carbon black and blue pigment with polyvinyl pyrrolidone and a solution of a cation active invert soap in an organic solvent and then drying the mixture.

3,954,496

PREPARATION OF DENSE SILICA-ENCAPSULATED ALUMINUM FLAKE PIGMENT TREATED WITH A CARBOXYLIC CHROMIC CHLORIDE

Kenneth Batzar, Piscataway, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 9, 1974, Ser. No. 513,308

Int. Cl.² C09C 1/20

U.S. Cl. 106—308 B 9 Claims

1. In a process for the preparation of a dense silica-encapsulated aluminum flake pigment by the steps of precipitating said dense silica from an aqueous suspension of finely divided aluminum flake pigment which contains active silica, the improvement for stabilizing said pigment against gassing when in contact with water, wherein a carboxylic chromic chloride is added to said silica-encapsulated aluminum flake pigment in an aqueous dispersion, said carboxylic chromic chloride being added in an amount from about 2% to about 20% by weight, based on said aluminum flake pigment.

3,954,497

HYDROLYSIS OF DECIDUOUS WOOD

Hermann Friese, Berlin, Germany, assignor to Sud-Chemie A.G., Munich, Germany

Filed Nov. 13, 1974, Ser. No. 523,455

Claims priority, application Germany, Nov. 23, 1973, 2358407

Int. Cl.² C13K 13/00

U.S. Cl. 127—37 23 Claims

1. A process for the hydrolysis of deciduous wood which comprises:

a. hydrolyzing deciduous wood with an alkali metal hydroxide solution having a concentration of less than 4 percent by weight, to provide a deciduous wood from which the chemically bound acetic acid therein has been substantially completely removed, said acetic acid being then present in solution as alkali metal acetate;

b. recovering the deciduous wood from which the chemically bound acetic acid has been substantially removed; and

c. hydrolyzing the deciduous wood of step (b) with a mineral acid to provide a solid residue containing lignin and an acidic solution of D-(+)-xylose.

3,954,498

ALUMINUM FOIL CLEANING PROCESS

Dervin L. Flowers, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Oct. 3, 1974, Ser. No. 511,817

Int. Cl.² C23G 1/00

U.S. Cl. 134—2 5 Claims

1. A process for preparing an aluminum foil for coating with photoresist for the purpose of preparing an etched strip for semiconductor assembly comprising the step of cleaning said aluminum foil with a water solution comprising one to five percent ammonium persulfate, one to five percent sodium chlorate and one to three percent of a surfactant selected from the group consisting of dioctyl sodium sulfo succinate and dodecyl benzene sulfonate.

3,954,499

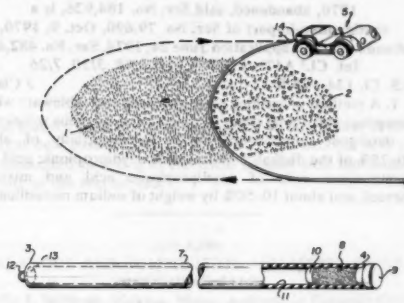
METHOD AND APPARATUS FOR REMOVING DEW FROM A GREEN

Umberto Canto, Horsham, Pa., assignor to Max Hankin, Horsham, Pa.

Filed Apr. 25, 1974, Ser. No. 464,125

Int. Cl.² B08B 7/00; A63B 71/00

U.S. Cl. 134—6 14 Claims



1. A sweeper for cleaning dew off of the surface of a golf green comprising,

a flexible elongated body, said body including a first end and a second end; and

means for maintaining said second end of said flexible elongated body at a substantially fixed location relative to said surface of said golf green upon the rotation of said first end of said flexible elongated body about said second end, said flexible elongated body being hollow, and including a substantially smooth outer surface so that said golf green is not damaged by the movement of said flexible elongated body across its surface, said means further comprising a weight mounted within the second end of said flexible elongated body, and at least one plug means located within said hollow flexible elongated body, the outside diameter of said plug means substantially coinciding with the inside diameter of said flexible elongated body so as to close off said flexible elongated body and maintain said weight means at a fixed location therein, so that said weight and said plug means do not interfere with the substantially smooth surface thereof.

10. A method for sweeping dew off of the surface of a golf green without damaging said surface, comprising moving a flexible elongated hollow body including a first end and a second end across said surface of said golf green in a direction transverse to said flexible elongated body, while maintaining said flexible elongated body substantially in contact with said surface of said golf green, said second end of said flexible elongated body being maintained in a substantially fixed location relative to said surface of said golf green by means com-

prising a weight mounted within the second end of said flexible elongated body, and at least one plug means located within said hollow flexible elongated body, the outside diameter of said plug means substantially coinciding with the inside diameter of said body so as to close off said flexible elongated body and maintain said weight means at a fixed location therein, and furthermore said flexible elongated body including a substantially smooth outer surface so that upon the transverse movement of said flexible elongated body across the surface of said golf green said surface is not damaged thereby.

3,954,500

DETERGENT COMPOSITIONS AND DISHWASHING METHOD

George E. Brown, Jr., Cincinnati, Ohio, assignor to Safe-Tech, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. Nos. 220,476, Jan. 24, 1972, abandoned, and Ser. No. 184,926, Sept. 29, 1971, abandoned, said Ser. No. 220,476, is a division of Ser. No. 79,690, Oct. 9, 1970, abandoned, said Ser. No. 184,926, is a continuation-in-part of Ser. No. 79,690, Oct. 9, 1970, abandoned. This application June 24, 1974, Ser. No. 482,479

Int. Cl.² A47L *15/14*; C11D *3/08*, *3/20*, *7/26*

U.S. Cl. 134—25 R 3 Claims

1. A method of washing eating utensils and tableware which comprises subjecting them to an agitated aqueous solution of a detergent composition consisting essentially of about 20–75% of the dialkali metal salts of oxydipropionic acid, the diammonium salts of oxydipropionic acid and mixtures thereof, and about 10–50% by weight of sodium metasilicate.

3,954,501

RECHARGEABLE ELECTRODES UTILIZING UNSINTERED FLUOROCARBON BINDER

Guy Rampel, 1319 NW. 7th Ave., Gainesville, Fla. 32601

Continuation of Ser. No. 432,318, Jan. 10, 1974, abandoned, which is a continuation of Ser. No. 131,427, April 5, 1971, abandoned, which is a division of Ser. No. 742,156, July 13, 1968, Pat. No. 3,630,781. This application Apr. 28, 1975, Ser. No. 572,321

Int. Cl.² H01M *35/02*

U.S. Cl. 136—24 9 Claims

1. A rechargeable electrolytic cell having enhanced gas recombination, capacity and cycle life, said cell comprising:
a positive electrode;
a negative electrode;
a separator;
an electrolyte; and
one of said electrodes comprising:
a foraminous, electrically conductive, substrate;
a paste supported by said substrate, said paste comprising:
a finely divided, particulate, rechargeable, active material; and
a fibrous interconnecting network of an unsintered, uncoalesced, hydrophobic linear fluorocarbon polymer, said active material dispersed throughout and bound in said network and being highly accessible to said electrolyte and to gas being generated during overcharge of the cell.

3,954,502

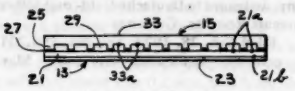
BIPOLAR ELECTRODE FOR CELL OF HIGH ENERGY DENSITY SECONDARY BATTERY

Philip C. Symons, and Harry K. Bjorkman, Jr., both of Birmingham, Mich., assignors to Energy Development Associates, Madison Heights, Ill.

Continuation-in-part of Ser. No. 393,548, Aug. 31, 1973, abandoned, which is a continuation-in-part of Ser. No. 200,041, Nov. 18, 1971, abandoned. This application Sept. 8, 1975, Ser. No. 610,950

Int. Cl.² H01M *4/00*

U.S. Cl. 136—86 A 2 Claims



1. A bipolar electrode apparatus for use in a secondary electric energy storage device, comprising a first member permeable to electrolyte, but gas impermeable and through which electrolyte containing dissolved oxidant may be caused to flow during both the charge cycle during which current is passed through the electrode apparatus causing electrochemical deposition of oxidant on the said first member, and which during the discharge cycle dissolved oxidant may be electrochemically reduced within the porous member, said first member having a porosity between 20% and 80% of its volume and a pore size from about 5 to 300 microns and having a flat front side and a grooved back side so as to be maintained in a flooded condition, a second member which is both gas and electrolyte impermeable and having a flat front side suitable for electrochemical deposition of a highly electropositive metal by means of passage of said current during the charge cycle and from which said highly electropositive metal may be electrochemically oxidized during the discharge cycle, said first and second members having a relative thickness in the ratio of between about 1:1 and 5:1 and being formed with a plurality of passageways generally from 5 to 25 in number, from 0.5 to 2.0 centimeters in width and from 0.5 to 5 millimeters in depth with a ratio of width to thickness in the range of approximately 2.1 to 10.1, and conductive means attaching the backsides of the first and second members of the bipolar electrode apparatus to thereby provide said front side of the first member as a positive electrode in one cell and said front side of the second member as the negative electrode of a second cell.

3,954,503

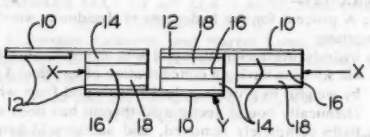
THERMAL CELL AND METHOD OF MAKING SAME

Glenn F. Zellhoefer, Normal, Ill., assignor to National Union Electric Corporation, Greenwich, Conn.

Filed Sept. 23, 1955, Ser. No. 536,685

Int. Cl.² H01M *6/36*

U.S. Cl. 136—90 14 Claims



1. A fusible salt electrolyte cell system including a compressed mass of non-fused electrolyte admixed with an adsorbent binder and in intimate contact with an anode, said adsorbent binder being present throughout the mass in an amount

sufficient to impart non-flow characteristics to the fused electrolyte so as to maintain the electrolyte against substantial displacement under pressure when the electrolyte is fused thereby to retain the fused electrolyte in intimate contact with said anode, said binder essentially comprising dehydrated kaolinite in a sheet layer crystalline structure form.

3,954,504

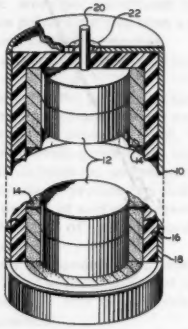
FUSED ELECTROLYTE CELL AND METHOD OF MAKING THE SAME

Glenn Faber Zellhoefer, Normal, Ill., assignor to National Union Electric Corporation, Greenwich, Conn.

Continuation-in-part of Ser. No. 536,685, Sept. 23, 1955. This application June 18, 1956, Ser. No. 593,015

Int. Cl.² H01M 6/36

U.S. Cl. 136—90 **14 Claims**



1. A fusible salt electrolyte cell system including a cathode, an anode, and a mass of non-fused electrolyte in contact therewith and wherein said cathode and electrolyte components essentially consist of a series of layers of powders compressed under a pressure of the order of 50,000 to 60,000 p.s.i. into a single pellet with adjacent layers intimately united, said electrolyte being admixed with dehydrated kaolinite in a sheet layer crystalline structure form, which is present throughout the mass of electrolyte in an amount sufficient to impart nonflow characteristics to the fused electrolyte so as to maintain the electrolyte against substantial displacement under pressure when the electrolyte is fused thereby to retain the fused electrolyte in intimate contact with said anode, and heat source material adjacent said electrolyte and adapted to release heat in an amount adequate to fuse said electrolyte so as to activate the cell.

3,954,505

MULTICELL ALKALINE PRIMARY BATTERY

Kent V. Anderson, Madison, Wis., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Apr. 14, 1975, Ser. No. 568,044

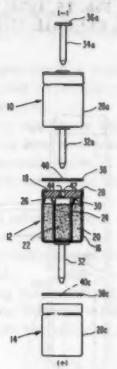
Int. Cl.² H01M 6/06

U.S. Cl. 136—110 **9 Claims**

1. A multicell alkaline cell battery which comprises:

a. a first cell comprising a top, a metallic container attached to the top forming the sides and the bottom of the cell, within the container an anode mix, a cathode mix in electrical contact with the container, a separator located between the anode mix and the cathode mix, an electrolyte within pores of the anode mix, the cathode mix and the separator and attached to the bottom of the container directed away therefrom a metallic current collector; and,

b. a second cell comprising a top, a metallic container attached thereto, within the container a cathode mix, in electrical contact therewith an anode mix, a separator between the anode mix and the cathode mix, and an electrolyte located in pores of the anode mix, the cathode mix and the separator, the battery being further identified



in that the current collector attached to the bottom of the first cell passes through the top of the second cell, is embedded in and is in electrical contact with the anode mix of the second cell.

3,954,506

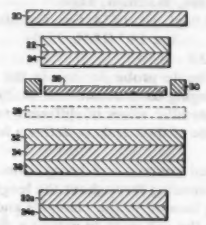
ZINC ANODE AND COMPOSITION AND METHOD FOR PRODUCING SAME

Charles I. Sullivan, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 199,216, Nov. 16, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,925

Int. Cl.² H01M 13/06

U.S. Cl. 136—127 **2 Claims**



1. A thin flat anode assembly comprising an electrically conductive organic resin substrate, and a coating on said substrate comprising zinc dust adhered by dried polymer particles formed from solvent swollen aqueous latex particles of a compatible organic polymeric binder, said polymer binder being present at a level of about 0.5 to 5 weight percent based on the weight of zinc dust.

3,954,507

THERMOCOUPLES USED FOR MEASURING TEMPERATURES

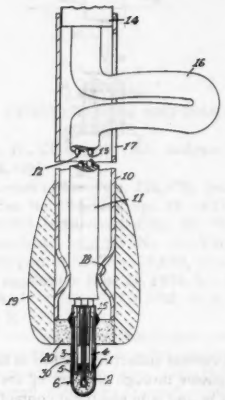
Dennis Ephraim Carter, 8, 2nd Avenue, Bez. Valley Johannesburg, Transvaal, Johannesburg, South Africa

Filed June 3, 1974, Ser. No. 475,893

Claims priority, application South Africa, June 13, 1973, 73/4002; June 29, 1073, 73/4437; Aug. 3, 1973, 73/5307; Jan. 3, 1974, 74/0050; Feb. 15, 1974, 74/1016

Int. Cl.² H01L *35/10*

U.S. Cl. 136—233 5 Claims



1. A thermocouple hot junction member including thermocouple conductor elements, a tubular jacket for the conductor elements, and bridge means comprising a conductive, refractory powder mass within the jacket forming a thermocouple junction for opposed ends of the conductors, the bridge means possessing a sufficiently high melting temperature to retain its powder form at temperatures in excess of 1200°C.

3,954,508

HIGH TEMPERATURE THERMOCOUPLE PROBE

Howard Derby, Merrimack, N.H., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sept. 10, 1974, Ser. No. 504,780

Int. Cl.² H01L *35/04*

U.S. Cl. 136—233 3 Claims

1. A thermocouple probe for use in the measurement of temperatures ranging from about 752° to 2012°F comprising

a. a pair of metallic wires of different material interconnected to one of their ends to define a hot junction of the probe,

b. an elongated ceramic rod being formed with a pair of channels extending throughout the length of the rod, the wires being located in the channels and being of longer length than the rod so as to extend a distance out of the end of the rod opposite to the hot junction,

c. an elongated titanium tube disposed securely around the ceramic rod, the tube forming a temperature protective covering for the ceramic rod,

d. a heat insulating tube being securely disposed around a portion of the titanium tube to create a low temperature surface for handling the probe,

e. a flexible, continuous heat insulating tube disposed around the wires extending out of the end of the rod opposite to the hot junction for impeding the transfer of heat from the wires extending from the rod, and

f. a pair of flexible teflon tubes each being disposed around

one of the exposed wires and within the flexible heat insulating tube for insulating the wires.

3,954,509

METHOD OF PRODUCING LOW EXPANSION ALLOYS

David Francis Lupton, Birmingham; John Jefferson Mason, Willenhall, and Peter John Penrice, Birmingham, all of England, assignors to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 517,960, Oct. 25, 1974, which is a continuation-in-part of Ser. No. 466,286, May 2, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,288

Int. Cl.² C21D *6/00*; C22D *1/10*

U.S. Cl. 148—3 5 Claims

1. A process for treating a cast low expansion carbidic alloy consisting essentially of, by weight, from about 21 to about 43% nickel, up to about 18% cobalt, from about 0.3 to about 1% carbon, up to about 3% chromium, from about 0.2 to about 1.2% vanadium, up to about 3% molybdenum, up to about 0.5% aluminum, up to about 0.5% silicon, up to about 2% manganese, up to about 290 zirconium, up to about 2% niobium, up to about 2% tungsten, up to about 0.1% magnesium, up to about 0.05% calcium and up to about 0.2% in total of elements of the group yttrium, lanthanum and lanthanides, with the provisos that the sum of the chromium, molybdenum, vanadium, zirconium, niobium and tungsten contents is in the range of from about 1 to about 4, the sum of % Ni + 0.75 (% Co) is 31.5 to 43 and the nickel to iron ratio is at least equal to 0.4:1, the balance, apart from impurities, being essentially iron, comprising subjecting the cast alloy directly to a temperature in the range of about 500° to about 900°C for a period of time in the range of from about 1 to about 24 hours to increase the strength and reduce the coefficient of thermal expansion of said alloy, said alloy having in the heat-treated condition a 0.2 proof stress at 500°C greater than 200 N/mm² and a coefficient of thermal expansion over the temperature range 20° to 250°C not greater than 6.5×10^{-6}/°C.

3,954,510

METAL TREATING COMPOSITIONS OF CONTROLLED pH

Walter H. Gunn, Painesville, and Jon A. de Ridder, Ashtabula, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 298,645, Oct. 18, 1972, abandoned. This application Sept. 9, 1974, Ser. No. 504,380

Int. Cl.[2] C23F 7/26

U.S. Cl. 148—6.2 8 Claims

7. The method of preparing a corrosion resistant coated metal substrate having an adherent coating from a pulverulent-zinc-containing coating composition exhibiting enhanced compositional stability at a pH below 6 and above about 4.5, which composition is adapted for treating metal substrates and providing corrosion resistance thereto, and is prepared to contain hexavalent-chromium-providing substance from a pulverulent-zinc-free precursor constituent component (A), and to further contain pulverulent zinc from a pulverulent zinc component (B), which method comprises:

I. formulating the coating composition of enhanced stability by:

1. preparing said precursor constituent component (A) at a pH of above about 0.8 and below 3 and with a constituency comprising aqueous medium, dibasic hexavalent-chromium-providing substance supplied by compatible dibasic dichromate, and reducing agent for the hexavalent chromium provided by said substance;
2. determining the pH of said component (A) for establishing the pH effect of said component (A) on said coating composition;
3. preparing said pulverulent zinc component (B) to contain zinc in an amount sufficient to supply above about 50 grams per liter of pulverulent zinc to said coating composition;
4. determining the oxide content of the zinc of said component (B) for establishing the pH affect of said component (B) on said coating composition;
5. adjusting the pH affect of at least one of said components (A) and (B) when the need exists to provide a composition pH of below 6 but above about 4.5 on the blending of components for preparing said coating composition; and,
6. blending components together to prepare said coating composition at a pH of below 6 and above about 4.5; and thereinafter

II. applying the resulting coating composition to a metal substrate; and

III. permitting evaporation of volatile coating substituents thereby obtaining an adherent and corrosion resistant coating on said metal substrate.

3,954,511

SURFACE TREATMENT OF A WEATHER-RESISTANT STEEL

Satoshi Kado, Fujisawa; Tsuneyasu Watanabe, Kamakura, and Kazuhiro Masuda, Sagamihara, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 7, 1974, Ser. No. 521,875

Claims priority, application Japan, Nov. 12, 1973, 48-126980

Int. Cl.[2] C23F 7/10

U.S. Cl. 148—6.15 R 4 Claims

1. A liquid composition for surface treatment of a weather-resistant steel which comprises 5 to 50% of $Fe_3O_4 + Fe_xO_3$, 0.01 to 5% of phosphoric acid, 0.01 to 10% of at least one selected from the consisting of Pb, Ni, Cu, P, Zn, Cr and their compounds, 3 to 30% of butyral resin, the balance being solvent.

3,954,512

PROTECTIVE COATING OF FERROUS BASE METAL ARTICLES

Jerome J. Kanter, 12300 Hobert Ave., Palos Park, Ill. 60464

Continuation-in-part of Ser. No. 279,940, Aug. 11, 1972, Pat. No. 3,833,370, which is a continuation-in-part of Ser. No. 105,650, Jan. 11, 1971, Pat. No. 3,700,505, which is a continuation-in-part of Ser. No. 828,707, May 28, 1969, abandoned. This application Dec. 13, 1974, Ser. No. 532,461

Int. Cl.[2] C23C 7/04

U.S. Cl. 148—6.35 18 Claims

1. In a process for providing a coating on a ferrous base metal having an adherent oxide layer formed on a surface thereof, the steps comprising:

frictionally contacting said oxide layer of the ferrous base metal article with at least one metal in solid phase from Group III of the periodic table in order to complex said Group III metal with said oxide layer and form a coating thereon,

said Group III metal selected from the class consisting of aluminum, scandium, yttrium, and the rare earth metals,

oxidizing at least a portion of said Group III metal contained in said coating, and

frictionally contacting said oxidized Group III metal with pyrochlore-microlite mineral materials so as to at least form a complex with the oxide of the Group III metal.

3,954,513

FLAME CUTTING BY MEANS OF AN OXYGEN BEAM

Ivan Boschnakow, Halle, and Hans Fröhlich, Dollnitz, both of Germany, assignors to Zentralinstitut fur Schweisstechnik der Deutschen Demokratischen Republik, Halle, Germany

Filed July 14, 1975, Ser. No. 595,798

Claims priority, application Germany, July 31, 1974, 180206

Int. Cl.[2] B23K 7/00

U.S. Cl. 148—9 R 15 Claims

1. A method of flame cutting a workpiece by means of an oxygen beam, wherein the flow of cutting oxygen in the kerf of the workpiece is set to a value such that it continuously at least partially destroys the gaseous contamination layer which is formed in the course of the cutting operation and which militates against contact between the cutting oxygen and the melt, and also at least partially destroys the oxide surface layer formed, wherein the operating parameters of a cutting torch having a conically expanded cutting nozzle of circular cross-section are given by the equations

$$d_k = 0.40 \times (s/p) \pm 0.05 \text{ mm}$$

and

$$d = (0.021 \times p + 1.54)\, d_k \pm 0.05 \text{ mm},$$

where

d_k is the nozzle bore diameter

d is the diameter of the nozzle mouth

p is the pressure of the cutting oxygen and

s is the thickness of the cut,

and wherein the cutting speed is set for a drag of 1 to 8%, the length of the heating flame is at least five times the thickness of the cut but at least 250 mm, the pressure of the cutting oxygen is between 16 and 60 kp/cm^2 and the thickness of the cut is between 3 and 80 mm.

3,954,514

TEXTURELESS FORGING OF BERYLLIUM

Donald Webster, Saratoga, and Donald D. Crooks, San Jose, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Apr. 2, 1975, Ser. No. 564,427
Int. Cl.[2] C22D *1/18*
U.S. Cl. 148—11.5 F **4 Claims**

1. A method of enhancing the mechanical properties of beryllium containing bodies comprising the steps of subjecting cast and hot pressed beryllium bodies to a number of forging blows, restricting the metal flow resulting from such blows along only one axis of said body 90° to the blow, each odd-numbered blow deforming said body to a reduction in height from about 5% to 60% and each even-numbered blow being along the axis of metal flow of the preceding odd-numbered blow and essentially restoring the deformed body to its original shape, and annealing said body at a temperature sufficient to recrystalize the microstructure of said body.

3,954,515

PRODUCTION OF SUPERPLASTIC ZINC-ALUMINIUM ALLOY SHEET

Colin John Swanson, Bristol, England, assignor to ISC Alloys Limited, Bristol, England

Filed Apr. 7, 1975, Ser. No. 565,825
Claims priority, application United Kingdom, May 1, 1974, 19156/74
Int. Cl.[2] C22C *18/04*; C22F *1/16*
U.S. Cl. 148—11.5 R **5 Claims**

1. In a process for providing superplastic properties in alloys of zinc and aluminium, comprising (a) heat-treating a body of the alloy containing between 18 and 40% by weight of aluminium, the remainder being zinc together with any incidental impurities and minor ternary alloying components and alloy composition and temperature being such as to fall within the aluminium rich single-phase region of the zinc-aluminium phase diagram, until a substantially homogeneous structure is obtained, and thereafter (b) cooling the body of alloy to a temperature below 275°C at a cooling rate not in excess of 10°C per minute, and (c) working the body of alloy to reduce a dimension thereof by at least 90%, all the said percentage dimension reduction being carried out above 200°C, the improvement comprising initially cooling the body of alloy to a temperature of not less than 275°C and subsequently further cooling the body of alloy after the same has been at least partially worked, and carrying out more than half of the total percentage dimension reduction at a temperature of at least 275°C.

3,954,516

METHOD FOR ENHANCING THE DRAWABILITY OF LOW MANGANESE STEEL STRIP

Hsun Hu, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1974, Ser. No. 510,843
Int. Cl.[2] C21D *9/48*
U.S. Cl. 148—12 C **7 Claims**

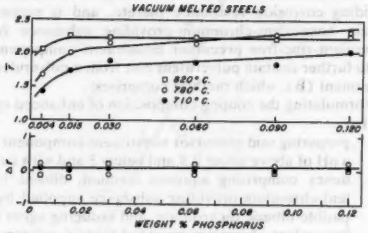
1. In the production of deep drawing steel strip, wherein hot rolled steel band,

consisting essentially of, in weight percent,

C	0.015 to 0.06
Mn	0.01 to 0.25
[P	0.12 max.]
Si	1.0 max.

balance Fe and incidental steelmaking component elements, wherein at least 0.015% C is present in uncombined form,

is cold rolled to effect a reduction in thickness of from 60 to 90 percent, and the resultant cold-reduced strip is thereafter slowly heated to an annealing temperature of at least about



650° C and held at said annealing temperature for a time sufficient to achieve a desired crystallographic texture, as evidenced by the *r* value of the resultant strip product,

the improvement in which said band contains P in an amount of from 0.015 to 0.12% and said annealing temperature is above the Ac_1 temperature, but below the Ac_3 temperature for such steel.

3,954,517

METHOD FOR MAKING CARBURIZED BEARING MEMBERS

Chester F. Jatczak; Jesse A. Burnett, both of North Canton, and Terry W. Mohr, Canton, all of Ohio, assignors to The Timken Company, Canton, Ohio

Filed July 22, 1975, Ser. No. 598,067
Int. Cl.[2] C23C *11/12*; C22C *38/44*, *38/46*
U.S. Cl. 148—16.5 **2 Claims**

1. A process for heat treating an alloy steel consisting essentially of about 0.1 to 0.3% carbon, 0.2 to 1% manganese, 0.2 to 0.6% silicon, up to 1.2% chromium, 2.5 to 3.5% nickel, 4 to 6% molybdenum, 0.25 to 0.85% vanadium and the remainder substantially all iron, said heat treating process comprising carburizing the steel, heating said steel to a temperature of about 2000°F followed by quenching, and subsequent refrigeration to −100°F to −120°F.

3,954,518

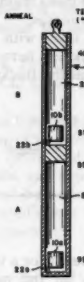
METHOD FOR REDUCING COMPOSITIONAL GRADIENTS IN MERCURY CADMIUM TELLURIDE

Joseph L. Schmit, Hopkins, and M. Walter Scott, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 19, 1975, Ser. No. 550,877
Int. Cl.[2] C22F *1/02*
U.S. Cl. 148—20.3 **4 Claims**

1. In a method of reducing compositional gradients in mercury cadmium telluride by heat treating a mercury cadmium telluride body in a closed container at a temperature near the solidus temperature, the closed container also containing a source of excess mercury vapor, the improvement comprising:

maintaining a mercury vapor pressure within the closed container which is lower than the equilibrium vapor pressure of mercury over a mercury cadmium telluride body at the temperature.



3,954,519

IRON-CHROMIUM-COBALT SPINODAL DECOMPOSITION-TYPE MAGNETIC ALLOY COMPRISING NIOBIUM AND/OR TANTALUM

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Inc., Yokohama, Japan

Filed Feb. 27, 1975, Ser. No. 553,651
Claims priority, application Japan, May 2, 1974, 49-49950
Int. Cl.² C04B *35/00;* **C22C** *38/18*
U.S. Cl. 148—31.57 **9 Claims**

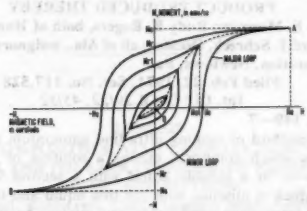
1. A spinodal decomposition-type magnetic alloy consisting by weight essentially of 3 to 20 % cobalt, 10 to 40 % chromium, 0 to 5 % aluminum, 0.2 to 5 % one or both of niobium and tantalum and the balance iron.

3,954,520

PROCESS FOR THE PRODUCTION OF MAGNETIC MATERIALS

Thomas J. Beaulieu, San Jose, Calif.; Michael A. Marchese, Boulder; Franklin T. Plante, Longmont, both of Colo., and Robert H. Tiaskal, De Funiak Springs, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1974, Ser. No. 449,861
Int. Cl.² H01F *1/02*
U.S. Cl. 148—105 **11 Claims**



1. A method for preparing finely divided magnetic cobalt-phosphorus alloy particles having a W/H_c of less than about 1.2 and useful in preparing high density recording media by chemical reduction, comprising the steps of:

preparing an aqueous solution consisting essentially of hypophosphite anion reducing agent and at least one soluble salt of cobalt as a source of cobalt cations and reacting said cobalt cations with said hypophosphite anions to produce magnetic cobalt-phosphorus alloy particles;

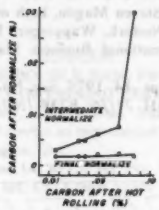
wherein the improvement comprises carrying out the reduction reaction to produce the cobaltphosphorus alloy particles in the presence of a D.C. magnetic field of at least about 200 gauss to form cobalt-phosphorous alloy particles characterized by a W/H_c of about 1.2 or less and useful in preparing high density recording media.

3,954,521

METHOD OF PRODUCING GRAIN ORIENTED SILICON STEEL

Frank A. Malagari, Jr., Freeport, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 785,873, Dec. 23, 1968, abandoned. This application Aug. 19, 1974, Ser. No. 498,798
Int. Cl.² H01F *1/04*
U.S. Cl. 148—111 **3 Claims**



1. A process for producing grain oriented silicon steel containing not more than about 0.005% carbon comprising the following steps:

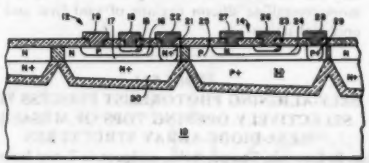
a. heating steel containing between 0.036 and 0.07% carbon and between 2 and 4% silicon at a temperature in excess of 2350°F;
b. hot rolling said steel;
c. heat treating said steel at a temperature in excess of 1600°F for at least about 30 seconds;
d. cooling said steel in a gaseous medium, without quenching;
e. cold rolling said steel;
f. normalizing said steel at a temperature in excess of 1400°F;
g. decarburizing said steel to a carbon level not greater than about 0.005% carbon; and
h. final annealing said steel.

3,954,522

INTEGRATED CIRCUIT PROCESS

Donald K. Roberson, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 28, 1973, Ser. No. 374,719
Int. Cl.² H01L *21/76, 29/04*
U.S. Cl. 148—175 **3 Claims**



1. A method of manufacturing a monolithic integrated circuit comprising the steps of:

a. providing a starting substrate of silicon semiconductor material having a high conductivity of a first type;

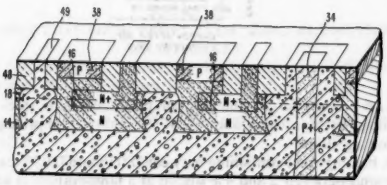
b. masking and etching a first surface of said starting substrate to form notches;
c. covering the notched surface of said starting substrate with a dielectric layer;
d. depositing a polycrystalline silicon handle on the dielectric layer;
e. lapping the second surface of the starting substrate to expose the dielectric layer in the notches and form islands; and
f. epitaxially depositing a layer of monocrystalline silicon of the same conductivity on the remaining surface of the starting substrate while forming insulatory polycrystalline silicon on the areas above the exposed dielectric layer.

3,954,523

PROCESS FOR FABRICATING DEVICES HAVING DIELECTRIC ISOLATION UTILIZING ANODIC TREATMENT AND SELECTIVE OXIDATION

Ingrid E. Magdo; Steven Magdo, both of Hopewell Junction, and William J. Nestork, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,562
Int. Cl.² H01L *21/76*; B23P *1/00*; H01L *27/12*
U.S. Cl. 148—175 **10 Claims**



1. A process for forming completely dielectrically isolated monocrystalline silicon regions on a substrate comprising:
depositing a first epitaxial silicon layer embodying an N-type impurity on a low resistivity silicon substrate embodying a P-type impurity,
forming annular P-type impurity regions in said first epitaxial layer that define ultimate isolation regions,
depositing a second epitaxial silicon layer embodying an N-type impurity on said first epitaxial layer,
forming annular P-type impurity regions in said second epitaxial layer in registry with said annular regions in said first epitaxial layer such that said P-type impurity regions in said first and said second epitaxial silicon layers merge to extend through said epitaxial layers,
converting said silicon substrate and said annular P-type regions in said first and said second epitaxial layers into porous silicon material by an anodic treatment carried out in an aqueous solution of hydrofluoric acid, and
oxidizing said porous silicon material to form silicon oxide, said silicon oxide surrounding and electrically isolating monocrystalline silicon regions of said first and second epitaxial layers.

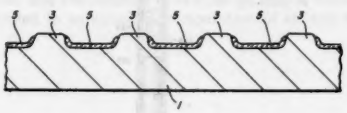
3,954,524

SELF-ALIGNING PHOTORESIST PROCESS FOR SELECTIVELY OPENING TOPS OF MESAS IN MESA-DIODE-ARRAY STRUCTURES

James R. Lawson, Tempe, Ariz., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 26, 1974, Ser. No. 492,090
Int. Cl.² H01L *21/306*
U.S. Cl. 148—187 **2 Claims**

1. A method for the fabrication of a p-n junction diode array which comprises the steps of:
a. forming an array of mesa regions on a semiconductor silicon slice;
b. forming an oxide layer on the surface of said semiconductor slice to cover the mesa regions and the semiconductor surface between the mesas;
c. coating said oxide layer with a positive photoresist to provide a resist thickness between mesas approximately four times as great as the thickness on the mesa tops;



d. exposing the photoresist for a time sufficient to react the complete thickness on the mesa tops, which permits about three-fourths of the resist thickness between mesas to remain unreacted;
e. developing the photoresist whereby the mesa tops are selectively exposed;
f. selectively etching the exposed mesa tops to remove said oxide layer therefrom; and thereafter
g. selectively diffusing an impurity of opposite conductivity type into the mesa regions thereby forming said diode array.

3,954,525

HOT-PRESSED SOLID DIFFUSION SOURCES FOR PHOSPHORUS

Thomas A. Myles, Tonawanda Township, and Curtis E. Zimmer, Youngstown, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 500,765, Aug. 26, 1974. This application Dec. 4, 1974, Ser. No. 529,656
Int. Cl.² H01L *7/44*
U.S. Cl. 148—189 **3 Claims**

1. A method for producing a solid phosphorus containing source body for semiconductor diffusion doping treatment comprising:
a. filling a mold with a powder comprising SiP_2O_7 and ZrP_2O_7,
b. hot-pressing the powder in the mold, and
c. cooling and removing the phosphorus containing source body.

3,954,526

METHOD FOR MAKING COATED ULTRA-FINE AMMONIUM PERCHLORATE PARTICLES AND PRODUCT PRODUCED THEREBY

Grafton F. Mangum; Rudy E. Rogers, both of Huntsville, and Edward J. Schreck, Decatur, all of Ala., assignors to Thiokol Corporation, Newtown, Pa.

Filed Feb. 22, 1971, Ser. No. 117,528
Int. Cl.² C06B *29/22*, *45/32*
U.S. Cl. 149—7 **23 Claims**

1. A method of making ultra-fine ammonium perchlorate particles which comprises mixing a solution of ammonium perchlorate in a volatile liquid with a second less volatile liquid which is miscible with the first liquid and is a non-solvent for ammonium perchlorate, said mixture having dissolved therein a small amount of a coating agent selected from linear carboxylterminated, liquid, hydrocarbon polymers, finely divided inert solids, surface active agents and mixtures thereof, simultaneously agitating said mixture and vaporizing said solvent liquid to form a suspension of fine ammonium perchlorate particles in said second liquid and evaporating at least a part of said second liquid to recover said ammonium perchlorate particles.

17. Sub-micron particles of ammonium perchlorate coated with a coating agent.

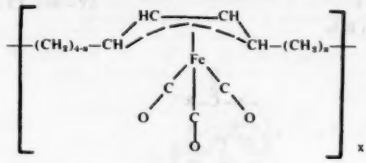
3,954,527

SOLID PROPELLANT WITH IRON-CARBONYL CONTAINING POLYMER BINDER

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 24, 1970, Ser. No. 24,896
Int. Cl.² C06B 45/10
U.S. Cl. 149—19.2 8 Claims

1. A propellant composition comprised of ammonium perchlorate, aluminum, curatives selected from tris(methylaziridinyl)phosphine oxide and triglycidyl derivative of para-aminophenol, lecithin, and a prepolymer binder-catalyst comprised of polycarbonyl-iron complexes which have been reacted directly with polybutadiene to yield a product represented by the following structure:



where n=0–4; x=one or multiples of one.

3,954,528

SOLID GAS GENERATING AND GUN PROPELLANT COMPOSITION CONTAINING TRIAMINOGUANIDINE NITRATE AND SYNTHETIC POLYMER BINDER

Marguerite S. Chang, Forest Heights; John H. Highby, Indian Head, and Gerald L. Mackenzie, Port Tobacco, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 6, 1970, Ser. No. 97,444
Int. Cl.² C06B 45/10
U.S. Cl. 149—19.4 7 Claims

1. A composite propellant composition comprising (1) an oxidant selected from the group consisting of cyclotetramethylene tetranitramine, cyclotrimethylene trinitramine, ammonium nitrate, 5-aminotetrazole nitrate, ammonium perchlorate and mixtures thereof, (2) triaminoguanidine nitrate, and a compatible synthetic polymer binder.

3,954,529

FLARE COMPOSITION WITH CARBOXY FUNCTIONAL BINDER AND POLYALKYLENE OXIDE PHOSPHATE ESTER, AND METHOD

Russell Reed, Ridgecrest, Calif.; Graham Shaw, Garland, and Robert Meyer, North Ogden, both of Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed June 19, 1975, Ser. No. 588,142
Int. Cl.² C06B 31/02, 33/02
U.S. Cl. 149—19.6 6 Claims

1. In a flare composition of the type which comprises magnesium powder, a finely divided inorganic oxidizer, and a cured carboxy-functional polymeric binder, the improvement which comprises a small amount of a polyalkylene oxide phosphoric acid ester incorporated in said composition as a passivating agent.

3,954,530

IGNITABLE COMPOSITIONS COMPRISING LEAD MONOXIDE AND BORON

Kenneth John Holloway, Welling; George William Charles Taylor, Waltham Abbey, and Arwyn Theophilus Thomas, Orpington, all of England, assignors to Ministry of Defence, London, England

Filed Mar. 7, 1967, Ser. No. 621,366
Int. Cl.² C06B 43/00
U.S. Cl. 149—22 9 Claims

1. An ignitable composition which comprises crystalline lead monoxide having up to about 10 percent by weight of finely divided boron entrained within, and substantially uniformly dispersed throughout, individual lead monoxide crystals.

3,954,531

COMPOSITE DOUBLE BASE PROPELLANT COMPOSITION CONTAINING FERRIC FLUORIDE

Theodore F. Comfort, Cumberland, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 14, 1973, Ser. No. 370,585
Int. Cl.² C06B 33/08
U.S. Cl. 149—38 10 Claims

1. In a composite-modified double base propellant containing aluminum, the improvement comprising about 1–3 weight percent of ferric fluoride as a combustion catalyst in combination with said propellant.

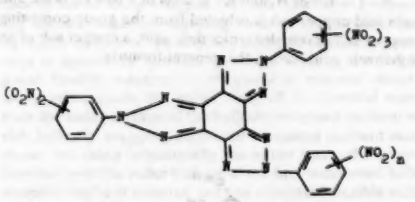
3,954,532

EXPLOSIVE COMPOSITIONS OF HIGH THERMAL STABILITY

Tivadar Kompolthy; Gyözö Bencz, and Jänos Deres, all of Budapest, Hungary, assignors to Vegyi- es Robbanoanyagipari Felugyelet and Orszagos Koolaj- es Gazipari Troszt, both of Budapest, Hungary

No Drawing. Filed Dec. 27, 1973, Ser. No. 428,752
Claims priority, application Hungary, Jan. 15, 1973, RO694
Int. Cl.² C06B 31/00
U.S. Cl. 149—45 12 Claims

1. An explosive composition or mixture of high thermal stability, comprising at least one nitrated 2,5,8-triphenyl-tris-triazolobenzene derivative of the general formula (I)



(I),

wherein *n* represents an integer of two or three, or a nitromethane or nitric acid adduct thereof.

3,954,533
HIGH PRESSURE-BURNING PROPELLANT COMPOSITION

Albert T. Camp, Indian Head, Md., and Elmer R. Csanady, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1969, Ser. No. 872,434
Int. Cl.[2] C06B 25/26
U.S. Cl. 149—98 **8 Claims**

1. A propellant composition comprising nitrocellulose, nitroglycerin and a ballistic modifier which is comprised of at least one lead salt and at least one copper salt of a different acid moiety; wherein said lead salt is selected from the group consisting of a lead salt of o-hydroxynicotinic acid, a lead salt of an amidobenzoic acid having the general formula

wherein R is

R′ is

or H, and R″ is alkyl of 1 to 4 carbons, and a lead salt, in normal or monobasic form, of an amidosalicylic acid having the general formula

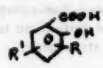
wherein R is

R′ is —N—C—R″ or H, and R″ is alkyl of 1 to 4 carbons; and wherein said copper salt is selected from the group consisting of a copper salt of o-hydroxynicotinic acid, a copper salt of an amidobenzoic acid having the general formula

wherein R is

R′ is

or H, and R″ is alkyl of 1 to 4 carbons, a copper salt, in normal or monobasic form, of an amidosalicylic acid having the general formula



wherein R is

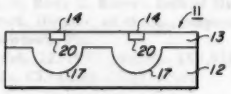
R′ is

or H, and R″ is alkyl of 1 to 4 carbons, a copper salt, in normal or monobasic form, of betaresorcylic acid, a copper salt, in normal or monobasic form, of salicylic acid, a copper salt, in normal or monobasic form, of 2,5 dihydroxybenzoic acid and a copper salt, in normal or monobasic form, of 5 methylene disalicylic acid.

3,954,534
METHOD OF FORMING LIGHT EMITTING DIODE ARRAY WITH DOME GEOMETRY

Donald R. Scifres, Los Altos, and Robert D. Burnham, Los Altos Hills, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1974, Ser. No. 518,335
Int. Cl.[2] H01L 7/50
U.S. Cl. 156—7 **5 Claims**



1. A method of making a light emitting diode having one region with a curved surface comprising the steps of:

forming a curved depression in a support substrate,

forming on said curved depression a first crystal layer of semiconductor material containing a substantial amount of aluminum,

forming on said first layer a second crystal layer of a material containing substantially no aluminum,

forming a rectifying junction in said second layer and centered over said depression, and

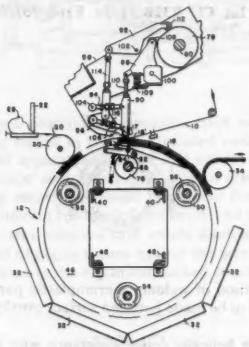
immersing said layered structure in a bath of an acid which reacts rapidly with said aluminum-containing material but does not react substantially with said material which contains substantially no aluminum thereby to dissolve said first layer to separate said substrate from said second layer such that a light emitting diode having a curved surface is formed.

3,954,535

METHOD AND APPARATUS TO PRODUCE A TEXTILE PRODUCT

Charles A. Wethington, Spartanburg, and Michael W. Gilpatrick, Chesnee, both of S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 29, 1974, Ser. No. 455,981
Int. Cl.² A46D 1/00; D04H 11/08
U.S. Cl. 156—72 4 Claims



1. A method of producing a textile fabric having an upper movable blade and a lower set of movable blades comprising the steps of: providing a supply of yarn, moving one of the lower blades upwardly, maintaining the lower edge of the upper blade substantially parallel to the upper edge of the lower blades while moving the upper movable blade downward in a curved angular path against the yarn and bending the yarn over the upwardly moved lower blade, moving the upper blade sideways against the yarn to pack the yarn against one of the lower blades, moving the next adjacent lower blade upwardly against the yarn and bending the yarn over the upper blade to form a loop therein, supplying a backing sheet and adhering the formed yarn loop to the backing sheet.

3,954,536

PROCESS FOR MUTATING YEAST

Guido Pacchetti, Parma, and Epifanio Bacchi, Manerbio (Brescia), both of Italy, assignors to Liquichimica S.p.A., Milan, Italy

Filed Mar. 19, 1975, Ser. No. 559,633
Claims priority, application Italy, Mar. 27, 1974, 49767/74
Int. Cl.² C12K 1/02
U.S. Cl. 195—76 5 Claims

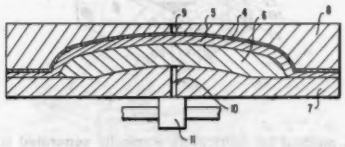
1. A process for mutant enriching cultures of edible yeasts comprising treating the cultures with 5-fluoro-uracil, said treatment with 5-fluoro-uracil being effected after a growth stage in rich media plus glucose and being followed by a growth stage in rich media plus glycerin.

3,954,537

PRODUCTION OF MULTIPLE-LAYER SHEETS, PANELS, SHAPED ARTICLES

Franz-Werner Alfter, Siegburg; Hans-Ulrich Breitscheidel, Troisdorf; Heinz-Gerd Reinkemeyer, Troisdorf, and Manfred Simm, Troisdorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Dec. 31, 1974, Ser. No. 537,762
Claims priority, application Germany, Dec. 31, 1973, 2365203
Int. Cl.² B32B 31/26, 31/28
U.S. Cl. 156—82 7 Claims



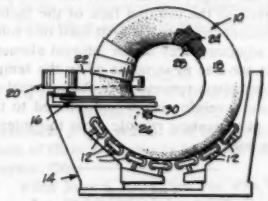
1. A process for the production of multiple-layer sheets, panels, shaped articles, or the like laminate having at least one layer of polyurethane foam material, which comprises bonding at least one side of the polyurethane foam layer under the action of heat to a layer of crosslinked polyethylene foam material.

3,954,538

METHOD OF FORMING A TIRE CARCASS

Charles E. Grawey, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 12, 1974, Ser. No. 478,541
Int. Cl.² B29H 17/02
U.S. Cl. 156—117 7 Claims



1. A method of forming a tire carcass comprising the steps of: providing a toroidal member; helically wrapping elongated resilient material about and along substantially the entire body of the toroidal member; applying a vacuum to the inner surface of the helically wrapped resilient material in contact with the toroidal member; applying force to a substantial part of the outer surface of the helically wrapped resilient material to urge it against the toroidal member; helically winding elongated flexible substantially inextensible material about and along substantially the entire body of the toroidal member, over the outer surface of the helically wrapped resilient material; helically wrapping additional elongated resilient material about and along substantially the entire body of the toroidal member over the outer surface of the first-mentioned helically wrapped resilient material and the elongated flexible substantially inextensible material; and applying a vacuum in the area of the helically wound elongated flexible substantially inextensible material between the first-mentioned helically wrapped resilient material and the additional helically wrapped resilient material.

3,954,539

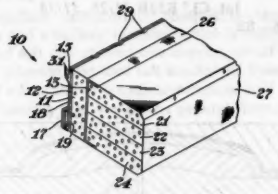
CRYOGENIC CONSTRUCTION AND ARTICLE THEREFOR

Hubert Stacy Smith, Jr., Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 302,839, Nov. 1, 1972. This application Sept. 16, 1974, Ser. No. 506,365

Int. Cl.² B65H 81/00

U.S. Cl. 156—185 1 Claim



1. A method for fabricating a spirally generated structure wherein a plurality of turns are deposited in a generally helical spiral fashion and adjacent loops affixed to each other to provide an integral structure about a cryogenic vessel, the improvement which comprises

employing as the insulating member an elongate insulating member having a generally rectangular cross-sectional configuration, the elongate member comprising a first or facing body of an insulating material comprising synthetic resinous closed cell thermoplastic foam, the facing body having an external surface and an internal surface extending across at least one surface of the cross-sectional configuration and the length of the body, the external surface and the internal surface being generally oppositely disposed to each other, a plurality of internal members, the internal members being affixed to the internal surface and extending generally the entire width thereof, each of the internal members having a length generally commensurate with the length of the body, the internal members being affixed to the internal face of the facing member and in adjacent relationship to at least one other internal member, adjacent faces of the internal elements are not joined but are free to separate when the temperature of the inner members remote from the external surface are reduced and a reinforcing scrim adhered to the internal members at a location remote from the internal face of the facing body.

3,954,540

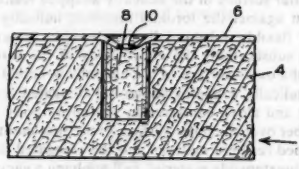
METHOD OF MAKING PERFORATED VINYL FILM CEILING BOARD

Walter W. Chamberlain, III, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 272,859, July 18, 1972, Pat. No. 3,844,875. This application Feb. 25, 1974, Ser. No. 445,610

Int. Cl.² B32B 3/10; E04B 1/86

U.S. Cl. 156—253 1 Claim



1. The process for making an acoustical ceiling product wherein the ceiling product will be composed of a base layer of a standard fiber composition ceiling board to which is laminated a plasticized vinyl film, the steps of laminating the plasticized vinyl film to the standard fiber composition ceiling board, then piercing both the vinyl film and ceiling board with punches to form perforations in both the film and the board, at the same time the vinyl film is pierced, there is a stretching of the vinyl film around the punch, withdrawing the punches from the board and allowing the ceiling product to age to permit the vinyl film perforations slowly to close until the size of the perforations in the vinyl film are substantially less than the size of the perforations within the ceiling board and the vinyl film is concave in the region around the perforations in the vinyl film.

3,954,541

WELDING OF THERMOPLASTICS THROUGH RESISTANCE HEATING

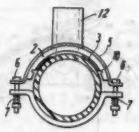
Helmut Landgraf, Rumeln-Kaldenhausen, Germany, assignor to Mannesmann A.G., Dusseldorf, Germany

Continuation of Ser. No. 256,384, May 24, 1972, abandoned. This application Sept. 23, 1974, Ser. No. 408,185

Claims priority, application Germany, June 1, 1971, 7121715[U]

Int. Cl.² B32B 31/04; F16L 13/10

U.S. Cl. 156—275 8 Claims



1. The method of welding thermoplastic parts whereby an areal bond is to be made between surface portions of the parts comprising:

providing a helically coiled resistance wire as heating element in a configuration outlining a flat star pattern;

placing the star in-between the said surface portions of the parts to be welded, while adapting its configuration to the contour of the surface portions, which cover the star completely on both sides and are being placed in juxtaposition, separated by the heating element,

applying electric current to the resistance wire, so that relatively large annular areas of the surface portions as juxtaposed fuse upon softening of the thermoplastic adjacent the star-shaped resistance wire; and

forcing said parts against each other, thereby embedding permanently the coiled heating element in between and providing sealed connection as between said parts with anchoring occurring through bonding of thermoplastic material in the interior of the coiled resistance element and around it with the parts proper as forced against each other.

3,954,542

LABELING MACHINE

William H. Solomon; John R. Davies, and Carrel M. Forward, all of Grand Rapids, Mich., assignors to Oliver Machinery Company, Grand Rapids, Mich.

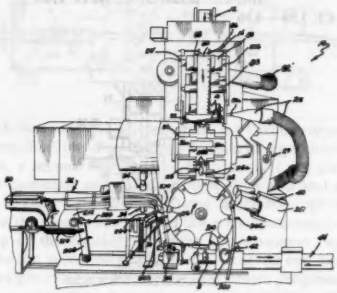
Division of Ser. No. 692,104, Dec. 20, 1967, Pat. No. 3,586,570. This application Aug. 11, 1970, Ser. No. 63,199

Int. Cl.² B32B 31/04

U.S. Cl. 156—360 15 Claims

1. Labeling apparatus for elongated articles such as pharmaceutical containers, comprising: label feed means and label applying means; article advancing means comprising rotational wheel means having a plurality of spaced releaseable article gripping means circumferentially therearound, shift-

able between an article receiving position, an article labeling position, a label checking position, and an article discharge position, as said wheel means rotates; each of said article gripping means having article-end engaging means shiftable axially, generally parallel to said wheel axis, between a contracted condition to engage articles on their ends and hold them with their axes parallel to said wheel axis and to each other, and an expanded cocked condition to receive or release articles; biasing means to bias said engaging means toward



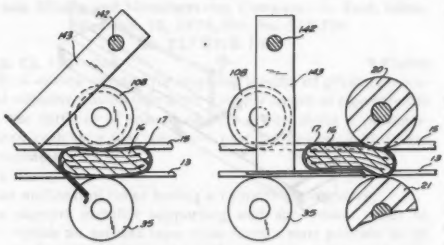
said contracted condition; releaseable latch means to retain said engaging means in cocked expanded condition; release means on said apparatus adjacent said article receiving position of said wheel means arranged to cause release of each of said engaging means for biased movement from cocked expanded condition to contracted condition; and cocking means on said apparatus adjacent said article discharge position to shift each said engaging means against the bias from the contracted condition to the expanded cocked condition for latching.

3,954,543

LABEL APPLICATOR

Edwin E. Messmer, 203 Leonard Young St., Oradell, N.J. 07649

Filed Sept. 15, 1972, Ser. No. 289,400
Int. Cl.² B65C 9/42
U.S. Cl. 156—363 **20 Claims**



1. Apparatus for applying labels to articles comprising:

a. means for continuously feeding articles along a path of travel, said article-feeding means including two side-by-side but spaced-apart conveyors;

b. means for holding the articles on the conveyors as the articles are fed;

c. means for feeding labels through the space between said conveyors into the path of travel of the articles so that the leading edge of each article engages a label between the ends of the label, the leading portion of each label from its free leading edge past the point it is first engaged by the leading edge of an article being free of engagement with any part of the apparatus at the time the label is first engaged by the article; and

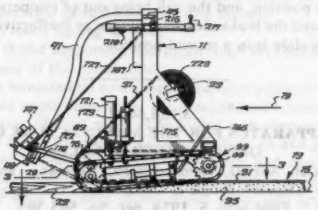
d. means for pressing engaged labels to the top and bottom surfaces of the article with which it is engaged.

3,954,544

FOAM APPLYING APPARATUS

Thomas Hooker, 560 Lockport St., Youngstown, N.Y. 14174

Filed June 20, 1974, Ser. No. 481,344
Int. Cl.² G01B 7/00
U.S. Cl. 156—356 **21 Claims**



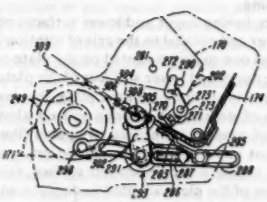
1. An apparatus useful for in situ preparation of and application of a foam-membrane covering, having an upper surface of controlled smoothness and being of controlled thickness, to a building roof surface to which the foam-membrane covering firmly adheres which comprises means for depositing a fluid, curable pre-foam of a rigid polymeric material onto a roof surface at a location where the foam produced therefrom is held in place on the roof, means for simultaneously laying the membrane a controlled distance away from the roof surface so that expanding foam produced from the applied pre-foam contacts the membrane and holds to it, and means for moving the pre-foam depositing means and the membrane laying means across the roof surface without moving the applied foam and membrane held to it across the roof surface, so that the foam is smoothed by the membrane and the thickness of the applied foam is controlled by the membrane as the foam-membrane covering is applied to the roof surface.

3,954,545

APPARATUS FOR PRINTING AND APPLYING PRESSURE SENSITIVE LABELS

Paul H. Hamisch, Jr., Franklin, and Donald L. Karn, Springboro, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed June 5, 1974, Ser. No. 476,745
Int. Cl.² B32B 31/00; B65B 61/26
U.S. Cl. 156—384 **21 Claims**



1. Apparatus for printing and applying pressure sensitive labels, comprising: a frame, means for supporting a supply roll of pressure sensitive labels carried on a web of supporting material, a platen and a cooperable print head mounted by the frame, a delaminator mounted by the frame for delaminating labels from the supporting material web, an applicator mounted by the frame for applying the delaminated labels,

means in contact with the web downstream of the delaminator for feeding the web to the delaminator, means for driving the web feeding means and the print head, brake means for applying a braking force on the web upstream of the delaminator when the driving means has completed a cycle of operation, the brake means including a movable brake member which is stationary in one position throughout the cycle, the feeding means including a feed wheel and a roll between which the web is received, a slide coupled to the roll, and a pin and slot connection between the slide and the movable brake member for moving the roll and the brake member when the slide is moved, the roll being in cooperation with the web and the brake member being in an effective position when the slide is in a first position, and the roll being out of cooperation with the web and the brake member being in an ineffective position when the slide is in a second position.

3,954,546

APPARATUS FOR THE MANUFACTURE OF OPTICAL-FIBER BUNDLES

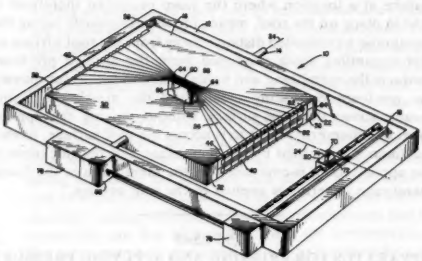
Hans-Dieter Aurenz, Rommelsbach, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Sept. 5, 1974, Ser. No. 503,300

Claims priority, application Germany, Sept. 6, 1973, 2344973

Int. Cl.² B65H *54/00*

U.S. Cl. 156—433 **10 Claims**



1. An apparatus for the manufacture of fan-shaped optical-fiber bundles, said apparatus comprising:

A. a frame,

B. a rotor journaled for rotation in the frame, said rotor comprising,

1. a plate having upper and lower surfaces parallel to one another and parallel to the axis of rotation of the rotor,

2. at least one spacer mounted on the plate perpendicular to the upper and lower surfaces of the plate and parallel to the axis of rotation of the plate, the spacer having a series of depressions therein spaced along the length thereof adapted to receive an optical fiber, and

3. at least one form block mounted on a surface of the plate having a saddle-shaped surface raised from the surface of the plate adapted to displace an optical fiber from the surface of the plate,

C. a fiber guide movably mounted with respect to the frame for movement parallel to the axis of rotation of the rotor,

D. means for rotating the rotor about its axis of rotation, and

E. means for moving the fiber guide coordinately with respect to the rotor such that an optical fiber guided by the fiber guide is wound on the rotor in a parallel fan-like manner

3,954,547

METHOD AND APPARATUS FOR PRODUCING LAMINATED GLASS SHEETS WITH THIN WIRES ARRANGED IN AN THERMOPLASTIC INTERMEDIATE LAYER

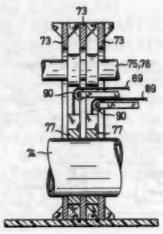
Werner Genthner, Pforzheim, Germany, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Nov. 28, 1972, Ser. No. 310,064

Claims priority, application Germany, Nov. 29, 1971, 2159072; Nov. 29, 1971, 2159073; Feb. 3, 1972, 2204939

Int. Cl.² B32B *5/08*; B21F *1/04*

U.S. Cl. 156—436 **11 Claims**



1. Apparatus for applying wires to a plastic sheet, said apparatus comprising two annular guide members, means to support said members with their axes inclined to each other, and an intermediate annular member of diameter smaller than said guide members disposed between said guide members eccentrically and substantially tangentially with respect to said guide members.

3,954,548

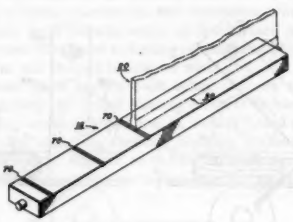
BINDING STRIP APPLICATOR

Neil A. Polit, Cary, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 22, 1973, Ser. No. 334,821

Int. Cl.² B42C *13/00*

U.S. Cl. 156—477 B **3 Claims**



1. Apparatus for binding a stack of sheets into a book-like assembly, comprising:

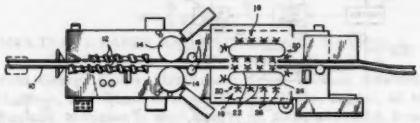
means for effecting intimate contact between the pages of said book-like assembly and a binding member, said binding member comprising a substrate having any one of at least two predetermined lengths and at least a low tack adhesive carried thereby; and

platen means, including a platen and a source of heat for the platen, for effecting a bonding of said pages and said binding member with the low tack adhesive, said platen being provided with at least one channel for preventing engagement of said platen with opposite and spaced apart short end sections of the binding member.

3,954,549
APPARATUS EMBODYING CONTINUOUS CONVEYORS FOR APPLYING LABELS TO CONTAINERS

Sidney T. Carter, Shrewsbury, Mass., assignor to A-T-O Inc., Cleveland, Ohio

Filed July 31, 1974, Ser. No. 493,217
Int. Cl.² B23K *27/00*
U.S. Cl. 156—486 **22 Claims**



1. In a labeling machine wherein there is a first conveyor for moving containers standing upright thereon along a predetermined path, a second conveyor having a straight run parallel to the first conveyor and curved runs leading into and away from the straight run, label pressing assemblies pivotally mounted on the second conveyor at intervals corresponding to the spacing of the containers on the first conveyor, means operative as the assemblies approach the curved end leading into the straight run for rotating the assemblies progressively forward a predetermined angular distance relative to the direction of movement of the second conveyor so as to decrease the radius of travel of the assembly about the end for effecting smooth transition from the linear movement along the straight run to the curvilinear movement about the end, reduce the centrifugal forces developed and initiate early engagement of the assemblies with the containers on the first conveyor and means operative as the assemblies approach the curved end leading away from the straight run for rotating the assemblies progressively rearwardly a predetermined angular distance relative to the direction of movement of the second conveyor so as to decrease the radius of travel of the assemblies about the end, to effect smooth transition from the linear movement of the assemblies along the straight run to the curvilinear movement about the end, reduce the centrifugal forces developed and prolong engagement of the assemblies with the containers on the first conveyor.

3,954,550
TAPE APPLYING DEVICE

Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 10, 1974, Ser. No. 513,596
Int. Cl.² B31B *1/60*
U.S. Cl. 156—486 **9 Claims**

5. A device adapted for applying lengths of pressure sensitive adhesive coated tape from a supply length of tape seriatim on the surfaces of spaced objects driven along a predetermined path in a first direction past the device, said device comprising:

a frame;

an application roller having a cylindrical periphery;

a support member supporting said application roller to define an arcuate tape route from a start position to an end position relative to said support member, said support member being mounted on said frame for pivotal movement about an axis transverse to said path and parallel to and spaced from the axis of said application roller to afford revolution of said application roller from a contact position with the portion of said periphery along said arcuate tape route disposed to afford contact of an end portion of a said supply length of tape thereon by an object driven along said path in said first direction, in a first direction of rotation to a second position to afford movement of the application roller along a length of tape being applied to the periphery of the object with the portion of said periphery along said arcuate tape route adjacent the object;

means on said frame adapted for supporting a said supply length of tape and for guiding an end thereof to the periphery at said start position and along said tape route with the adhesive coating of the tape disposed away from said application roller;

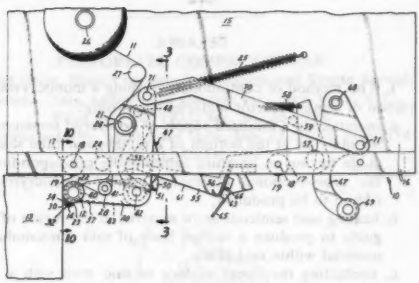
means mounted on said frame and adapted to be activated by movement of a said object past a predetermined position along said path for severing an applied length of tape from a said supply length of tape between said application roller and the object subsequent to movement of the object past said application roller;

means for biasing the support member to revolve the application roller back to the application position subsequent to operation of said tape severing means;

a pinch roller having an axis;

a pivot frame supporting said pinch roller for rotation about the axis of the pinch roller;

a collar mounted on said support member adjacent one end of said application roller for independent rotation about the axis of said application roller and supporting said pivot frame for pivotal movement about an axis generally normal to the axis of said pinch roller and spaced from one end thereof between an engage position of said pinch roller with the axes of the pinch roller and application roller generally parallel amd with the peripheral surfaces of the rollers proximate to engage opposite surfaces of



said tape positioned therebetween, and a release position of said pinch roller with the pinch roller spaced axially from one end of the periphery of said application roller;

means for biasing said pivot frame toward the engaged position of said pinch roller;

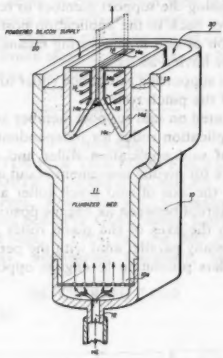
cam means adapted to move said pivot frame from said engage position to said release position and back to said engage position to afford movement of said pivot frame and pinch roller around the longitudinal edge of a said length of tape guided onto said application roller adjacent said start position upon rotation of said collar relative to said support member to move said pinch roller from said end position toward said start position along the peripheral portion of said application roller spaced from said arcuate tape route; and

means for rotating said collar relative to said support member to move said pinch roller from said end position to said start position along the peripheral portion of said application roller spaced from said arcuate tape route upon pivotal movement of said support member to move said application roller from said contact position to said second position, and for rotating said collar to move said pinch roller along the peripheral surface of said application roller at said arcuate tape route from said start position to said end position upon subsequent movement of said support member back to said contact position.

3,954,551
METHOD OF PULLING SILICON RIBBON THROUGH SHAPING GUIDE

Olin B. Cecil, Dallas, and Paul D. Maycock, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 17, 1974, Ser. No. 489,303
Int. Cl.² B01J *17/24*; C01B *33/02*
U.S. Cl. 156—608 **5 Claims**



1. The method of continuously forming a monocrystalline ribbon of semiconductor material comprising:

a. maintaining a fluidized supply of powdered semiconductor material at the bottom of a rectangular tube shaping guide having an aperture substantially corresponding to the cross-sectional dimension of the monocrystalline ribbon to be produced,

b. heating said semiconductor material in the region of said guide to produce a molten body of said semiconductor material within said guide,

c. contacting the upper surface of said melt with a seed ribbon, and

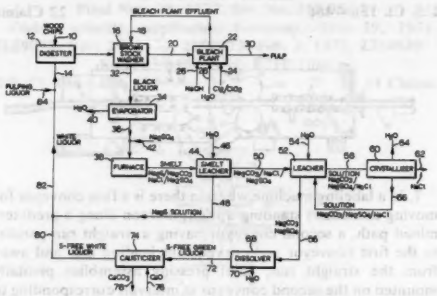
d. drawing said seed ribbon upward while maintaining the supply of said semiconductor material adjacent to the bottom of said guide.

3,954,552
REMOVAL OF SODIUM CHLORIDE FROM PULP MILL SYSTEMS

Jerome A. Lukes, Ogden, and Robert P. Schroeder, Salt Lake City, both of Utah, assignors to Erco Envirotech Ltd., Islington, Canada

Filed Aug. 5, 1974, Ser. No. 495,088
Int. Cl.² D21C *3/02*, *11/04*
U.S. Cl. 162—17 **31 Claims**

1. In a pulp mill process which comprises digesting cellulosic fibrous material with a pulping liquor containing sodium hydroxide and sodium sulphide as the pulping chemicals separating pulped material from spent pulping liquor, introducing sodium chloride to said spent pulping liquor, forming a smelt containing sodium sulphide, sodium carbonate and sodium sulphate from said spend pulping liquor, fractionating said smelt to form an aqueous sodium sulphide solution and a solid mixture of sodium carbonate, sodium sulphate and sodium chloride substantially free from sodium sulphide, and recycling said aqueous sodium sulphide solution to said digestion step to provide at least part of said sodium sulphide in said pulping liquor, the improvement which comprises forming from said solid mixture (1) a hot aqueous sodium chloride solution having a temperature such that subsequent cooling of said sodium chloride solution precipitates substantially pure sodium chloride therefrom and (2) a solid mass of sodium carbonate in anhydrous or monohydrate form and sodium sulphate substantially free from sodium chloride, separating said solid mass from said hot aqueous sodium chloride solution, forming an aqueous solution of said solid mass, convert-

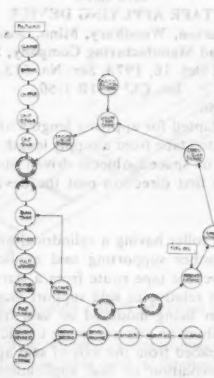


ing at least a substantial proportion of the sodium carbonate in the aqueous solution of said solid mass to sodium hydroxide, cooling said hot aqueous sodium chloride solution after said separation of said solid mass therefrom to cause precipitation of substantially pure sodium chloride therefrom, and removing said precipitated substantially pure sodium chloride from the resulting mother liquor.

3,954,553
NON-SULFUR PULPING PROCESS FOR CORRUGATING MEDIUM USING SODIUM CARBONATE AND SODIUM HYDROXIDE

Byron M. Dillard, Lynchburg, Va.; Robert J. Gilmer, Valdosta, Ga., and John D. Kennedy, Lynchburg, Va., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 253,331, May 15, 1972, abandoned.
This application June 13, 1974, Ser. No. 479,001
Int. Cl.² D21C *3/02*
U.S. Cl. 162—90 **3 Claims**



1. In the process for pulping hardwoods to produce pulp for corrugating medium wherein hardwood chips are cooked in an aqueous cooking liquor at elevated temperatures and pressures to penetrate and soften the chips, and the resulting softened chips are defibered to form said pulp for corrugating medium, the improvement wherein said chips are cooked in a sulfur free aqueous solution containing from about 15 to 50% of the total chemical as sodium hydroxide and 50 to 85% of

the total chemical as sodium carbonate both expressed as sodium oxide wherein the chemical to oven dry wood charge is from about 3 to 10% by weight expressed as sodium oxide at a temperature and for a time equivalent to the range of conditions between:

cooking at 376°F for 4 minutes, and

heating to 340°F in 50 minutes followed by cooking at 340°F for 45 minutes.

3,954,554
MULTI-PLY PAPER AND PAPERBOARD HAVING A WET-LAID PLY AND A DRY-LAID PLY

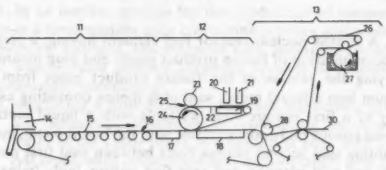
Harold George Curry, Hambrook; Brian William Attwood, Hanham, and Derek Graham Walter White, Bristol, all of England, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

Filed Aug. 21, 1973, Ser. No. 390,218

Claims priority, application United Kingdom, Sept. 9, 1972, 41958/72

Int. Cl.² D21H *1/02, 1/06*

U.S. Cl. 162—104 **10 Claims**



1. In a process for making a multi-ply paper sheet or board comprising the steps of, forming a first web by wet-laying fibres, forming a second dry-laid web at a location away from the first web by depositing dry fibres on a supporting band and applying adhesive or binder to the dry fibres, and subsequently transferring the dry-laid web onto the first wet-laid web, including utilizing moisture in the first wet-laid web to adhere the two webs together, the improvement wherein said step of forming the second dry-laid web includes passing the dry-laid web through a press nip formed between a press roll and a heated cylinder to consolidate the dry-laid web before it is transferred onto the first wet-laid web.

3,954,555
FIBER REINFORCED PLASTIC ARTICLES AND METHOD OF PREPARATION

Donald R. Kole, Cheektowaga, N.Y., and Walter E. Voisinet, Royal Oak, Mich., assignors to National Gypsum Company, Buffalo, N.Y.

Continuation-in-part of Ser. No. 293,742, Sept. 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 760,828, Sept. 19, 1968, abandoned. This application Feb. 14, 1974, Ser. No. 442,673

Int. Cl.² D21F *13/00*

U.S. Cl. 162—136 **20 Claims**

1. A method of making a board having a design impressed on the surface thereof with the design having a tonal effect with portions of different darkness comprising the steps of wet-forming a board from a mixture of a resin binder and reinforcing fibers and filler materials, drying the wet-formed board so as to remove substantially all the water therefrom, heating the dried wet-formed board within a predetermined range of elevated temperatures, pressing said board within said elevated temperature range to increase the reinforcement material resin bond, and impressing a design into said board by compacting the heated dried wet-formed board different amounts by a press element having a design surface within said elevated temperature range to cause the portions which were compacted greater amounts to have a darker coloration than the portions which were compacted lesser amounts solely as a result of compacting said board said different amounts, with the coloration of each portion extending uniformly throughout the thickness of the board.

3,954,556
INORGANIC COMPOSITION FOR HIGH TEMPERATURE USE AND METHOD OF FORMING A MILLBOARD THEREFROM

Fred L. Jackson, Denver, and John Wilmer Axelson, Littleton, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed June 10, 1974, Ser. No. 477,574

Int. Cl.² D21F *11/08;* **D21H** *5/18*

U.S. Cl. 162—145 **26 Claims**

1. A composition useful at temperatures in excess of 500°C which consists essentially of, in percentage by weight of the composition: 15–45% chrysotile asbestos fiber, 40–75% talc component, and 2–35% inorganic binder.

23. A method of manufacture of a millboard comprising the composition of claim **1**, which method comprises forming a water slurry of chrysotile asbestos fibers, talc component and inorganic binder, transferring said slurry to a rotating screen cylinder, transferring material from said cylinder to a moving belt, and thereafter to a rotating drum whereupon a thickness is accumulated by building up layer upon layer, thereafter slitting said accumulated layers longitudinally of the drum, forming the slit layers into flat sheet form and drying said layers.

3,954,557
PERFORATED COMPACTOR BAR

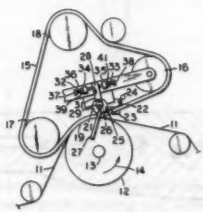
Albert Heim, Haus Zypresse, Switzerland, and Fausto Baroni, Verona, Italy, assignors to Clupak, Inc., New York, N.Y.

Filed Feb. 26, 1975, Ser. No. 552,981

Claims priority, application Italy, July 22, 1974, 52202/74

Int. Cl.² D21H *5/06*

U.S. Cl. 162—272 **8 Claims**



1. In a web treating apparatus comprising a cylindrical drum; a compactor bar having a sidewall includng a smooth curved surface portion located adjacent a peripheral, sector of the drum and extending generally parallel to the sector; a relatively thick endless belt of an elastomeric material arranged to pass between the peripheral sector of the drum and the curved surface of the compactor bar, with the outer surface of the belt contiguous to the drum and the inner surface of the belt contiguous to the bar; means for driving the belt between the compactor bar and the peripheral drum sector; means for enabling the compactor bar to press the belt against the drum in compressed condition so that a nip space between the outside surface of the belt and the peripheral sector of the drum is established, the outer belt surface stretching and subsequently contracting to its normal length as it passes through and beyond the nip space during operation of the apparatus; means for continuously supplying a liquid lubricant on the inside surface of the belt in advance of the compactor bar; and means for feeding a contractable web to be treated through the nip space between the belt's outer surface and the

drum, whereby the web initially adheres to the stretched outside surface of the belt passing through the nip space and, as the outside surface of the belt contracts in passing beyond the nip space, the web is compacted while it is still against the drum; the improvement comprising, said compactor bar having a liquid dam sidewall portion connected to the smooth curved surface portion and being located on the belt approach side of the compactor bar, the liquid dam portion extending along the length of the compactor bar; liquid confining means at each edge of the belt at least adjacent the belt approach side of the compactor bar for preventing liquid flow beyond the belt edges in the vicinity of the liquid dam sidewall portion of the compactor bar; the compactor bar having liquid receiving means associated therewith and being provided with at least one weir opening in that portion of its sidewall constituting the liquid dam, the weir opening being in communication with said liquid receiving means and being spaced a predetermined distance from the inside surface of the belt on the belt approach side of the compactor bar, whereby during operation of the apparatus and supply of liquid lubricant to the inside surface of the belt in advance of the compactor bar, a pool of lubricant may be established and maintained at the liquid dam portion of the compactor bar on the inside surface of the belt, the depth of the pool being determined by the distance of said weir opening from said inside surface of the belt on the belt approach side of the compactor bar, the surface of the pool being maintained at a constant level by the overflow of excess liquid through the weir opening into the liquid receiving means associated with the compactor bar.

3,954,558

FEEDING DEVICE FOR PAPER MACHINES

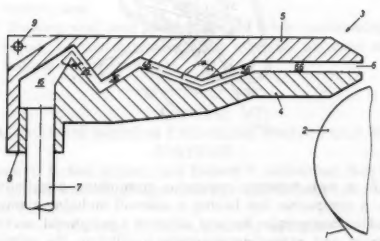
Dieter Egelhof, Heidenheim (Brenz), Germany, assignor to J. M. Voith GmbH, Heidenheim, Germany

Filed July 11, 1974, Ser. No. 487,810

Claims priority, application Germany, July 13, 1973, 2335602

Int. Cl.² D21F 1/06

U.S. Cl. 162—336 **8 Claims**



1. A feeding device, particularly for feeding a fibrous suspension to a forming wire of a paper machine, comprising a housing defining an interior passage consisting of a plurality of consecutive sections including an inlet section and an outlet section, each of said sections having an inlet and an outlet directly communicating with the inlet of the immediately following section, the flow-through cross-sectional area of at least one of said sections decreasing in direction from said inlet to said outlet thereof, each two immediately consecutive sections enclosing an angle with one another, said angle lying substantially between 70° and 170° and increasing from section to section toward said outlet section; and means for supplying the suspension to the inlet of said inlet section.

3,954,559

VENTED NUCLEAR FUEL ELEMENT

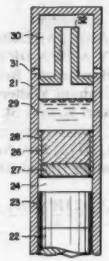
Masaomi Oguma, and Yasuo Hirose, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1972, Ser. No. 299,438

Claims priority, application Japan, Oct. 21, 1971, 46-83769

Int. Cl.² G21C 3/02

U.S. Cl. 176—68 **6 Claims**



1. A vented nuclear reactor fuel element having: a plenum for accumulation of fission product gases; and plug means for delaying the release of the fission product gases from the plenum into a liquid metal, said plug means consisting essentially of a first porous body wettable with a liquid metal, a second porous body non-wettable with the liquid metal, means mounting said second porous body between said first porous body and said plenum, and said first porous body being impregnated with the liquid metal and in contact with the liquid metal.

3,954,560

NUCLEAR FUEL ASSEMBLY

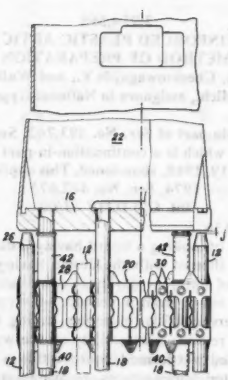
Jacques Delafosse, and Jean-Luc Viaud, both of Gif-sur-Yvette, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 137,269, April 26, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 313,996

Claims priority, application France, May 6, 1970, 70.16666

Int. Cl.² G21C 3/34

U.S. Cl. 176—78 **3 Claims**



1. A nuclear fuel assembly having a cluster of elongated pins, and means for retaining said pins in parallel relation and in a regular array, said means comprising a top end plate, a bottom end plate supporting the fuel pins, spacing grids, said fuel pins passing through said spacing grids, tie-rods connect-

ing said bottom plate to said top end plate and passing through said grids and said grids frictionally and resiliently engaging said fuel pins and said tie-rods for limited sliding movement of said grids on said tie-rods, stop members limiting the movements of the grids on and engaging the tie-rods, said stop members comprising tubular means slidably mounted on at least certain of the tie-rods and extending between the grids and a grid and plate and abutting against the grids and plates, the total length of the stop members and grids being less than the length separating the facing surfaces of the top and bottom plates to provide a clearance, said clearance being sufficient to allow for total differential elongation during operation.

3,954,561
PROCESS FOR PRODUCING MICROORGANISMS FROM ETHYLENE

Robert H. Lindquist, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 30, 1974, Ser. No. 510,206
Int. Cl.² C12B *1/00*
U.S. Cl. 195—28 R **10 Claims**

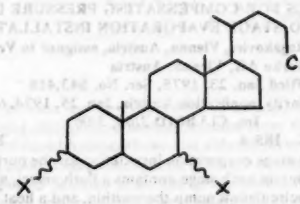
1. In an aerobic process for the production of microorganisms in a fermentation zone containing primary and secondary substrates, nitrogen, and essential salts, including phosphate, and wherein said primary substrate consists of ethanol, the improvement comprising:
   1. producing a fermentation zone feed containing primary and secondary substrates by contacting ethylene and water in the vapor phase in a hydration zone with a catalyst comprising phosphoric acid in association with a solid carrier to produce a crude liquid-phase water-ethanol-diethyl ether-acetaldehydephosphate-containing mixture;
   2. feeding said mixture to said fermentation zone without intervening purification and using said primary and secondary substrates to promote the propagation of said microorganisms;
   3. withdrawing from said fermentation zone an effluent and separating said effluent into a first microorganism-rich stream and a second stream containing water and unreacted substrate; and
   4. recycling at least a portion of said second stream to said hydration zone.

3,954,562
SYNTHESIS OF STEROIDS

William H. Saltzman, New Rochelle, N.Y., assignor to Intellectual Property Development Corporation, New Rochelle, N.Y.

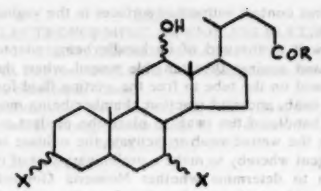
Filed Feb. 14, 1975, Ser. No. 550,082
Int. Cl.² C12D *13/02*
U.S. Cl. 195—51 S **5 Claims**

1. The method of producing a compound of the formula:



wherein each X is selected from the group consisting of hydrogen, hydroxy, acyloxy, alkoxy and oxo (O=), and R is selected from the group consisting of hydroxy, acyloxy, alkoxy, taurine and glycine, which comprises:

a. subjecting a compound of the formula



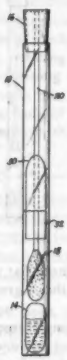
wherein X and R are as defined above, to the action of a 12-dehydroxylase enzyme produced by a clostridium perfringen microorganism in a suitable medium; and

recovering the said final product.

3,954,563
APPARATUS ESPECIALLY USEFUL FOR DETECTION OF *NEISSERIA GONORRHOEAE* AND THE LIKE IN FEMALES

Frederick C. Mennen, 506 Clay St., La Porte, Ind. 46350

Continuation-in-part of Ser. No. 193,739, Oct. 29, 1971, Pat. No. 3,876,503. This application Mar. 28, 1975, Ser. No. 563,300
Int. Cl.² C12K *1/00*
U.S. Cl. 195—127 **1 Claim**



1. An instrument for use in the rapid detection of Neisseria gonorrhoeae without gram-staining and without culture comprising:

an elongated rigid transparent tube;

said tube being destructible by incineration;

said tube being closed at one end and open at the other end;

a replaceable cover for the open end of the tube;

said tube containing a frangible ampul holding a wetting fluid for activating an oxidase indicating reagent stored therein at the closed end of the tube;

a combined swab and handle therefore with a reaction chamber slidably mounted on said handle, said swab and handle being disposed in said container between the cap and said ampul;

said reaction chamber including a dry pledget impregnated with an oxidase indicating reagent;

said swab comprising a substantially cylindrical body in the range of one-half inch in diameter and one-half inch in length and said reaction chamber including a housing for said pledget and an extension skirt to receive the swab to place the swab and pledget in contact;

the exposed end of said swab being adapted to be engaged against the cervix of a female patient to obtain a test sample while said skirt protects the side walls thereof

against contact with other surfaces in the vaginal cavity; and

said swab at the end of its handle being adapted to be pressed against the frangible ampul when the cap is pressed on the tube to free the wetting fluid for wetting the swab, and said reaction chamber being movable on the handle of the swab to place the pledget in contact with the wetted swab to activate the oxidase indicating reagent whereby to make a preliminary test of the specimen to determine whether Neisseria Gonorrhoeae is present by noting a color change on the swab when such is the case, whereupon the assembled instrument and its contents may be safely disposed of.

3,954,564

INSTRUMENT FOR THE DETECTION OF *NEISSERIA GONORRHOEAE* AND THE LIKE

Frederick C. Mennen, 506 Clay St., La Porte, Ind. 46350

Continuation-in-part of Ser. No. 193,739, Oct. 29, 1971, Pat. No. 3,876,503. This application Mar. 25, 1975, Ser. No. 561,707

Int. Cl.[2] C12K *1/00*

U.S. Cl. 195—127 **1 Claim**

1. A disposable instrument for use in the rapid detection of *Neisseria gonorrhoeae* without gram-staining and without culture comprising:

an elongated tube having transparent wall means;

said tube being closed at one end and open at the other end;

a replaceable cover means for said open end;

said tube and its cover containing a dry pledget that has previously been impregnated with an oxidase indicating reagent, a frangible ampul containing a wetting agent for activating said reagent, and a swab disposed at the end of a handle means that is approximately as long as said tube;

said ampul being disposed in said tube adjacent the closed end thereof;

said pledget being disposed between said ampul and the open end of said tube;

a restriction in said tube between the pledget and the open end thereof, said restriction defining a reaction chamber in said tube adjacent the closed end thereof;

the wall of said tube adjacent the reaction chamber being flexible; and,

said restriction normally holding the swab out of contact with the pledget but permitting the swab to be inserted into the reaction chamber from the open end of the tube after a test specimen has been collected on the swab and thereafter serving to hold the swab in contact with the pledget, said restriction being provided so that after the ampul has been fractured by squeezing the flexible wall means of the tube against it to release the fluid contained therein, the reagent impregnated in the pledget becomes activated and the specimen on the swab can be placed in contact therewith and the cap can be replaced on the tube so the test can proceed and upon completion thereof the instrument can be disposed of as a sealed unit.

3,954,565

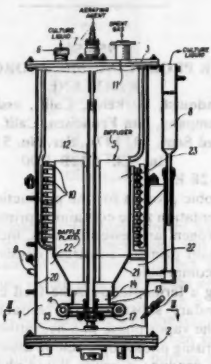
APPARATUS FOR CULTIVATING MICROORGANISMS

Ivan Danilovich Boiko, Varshavskoe shosse, 180, korpus 2, kv. 73, and Anatoly Vladimirovich Naidin, Smolenskaya ulitsa, 10, kv. 159, both of Moscow, U.S.S.R.

Continuation of Ser. No. 239,164, March 29, 1972, abandoned. This application June 11, 1975, Ser. No. 585,791

Int. Cl.[2] C12B *1/14*

U.S. Cl. 195—142 **6 Claims**



1. An apparatus for cultivating microorganisms, comprising: a container for the culture liquid; means to feed the culture liquid into said container; an aerating agent supply means; rotatable ejector means located inside said container for receiving the culture liquid and aerating agent to disperse and intermix the same; means to impart rotation to said ejector means; said container including a diffuser therein adapted to provide a directional flow of the culture liquid to the ejector means, said rotatable ejector means comprising a hollow body located inside the container beneath the diffuser and including a cylindrical-shaped portion for receiving the culture liquid in the container and arranged concentrically below the diffuser in spaced relation therewith, a toroidal portion coupled to said cylindrical portion for receiving the culture liquid from said cylindrical portion, ejectors on said toroidal portion, and a mixing chamber extending in prolongation of each said ejector and having an inlet connected to the aerating agent supply means, said ejectors being mounted on said toroidal portion within the mixing chamber, said mixing chamber extending from the ejectors in a direction opposite to the direction of rotation thereof.

3,954,566

APPARATUS FOR COMPENSATING PRESSURE DROPS IN A TWO-STAGE EVAPORATION INSTALLATION

Gundolf E. Rajakovics, Vienna, Austria, assignor to Vereinigte Edelstahlwerke AG, Vienna, Austria

Filed Jan. 23, 1975, Ser. No. 543,418

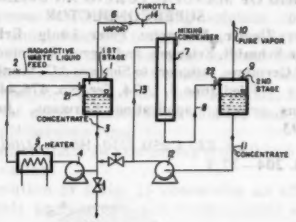
Claims priority, application Austria, Jan. 25, 1974, 637/74

Int. Cl.[2] B01D *3/00; 3/06*

U.S. Cl. 202—185 A **2 Claims**

1. In a two-stage evaporation installation for the purification of liquids wherein each stage contains a flash vessel, a recycle conduit, a recirculation pump therewithin, and a heat input to the first stage, the first stage being normally maintained at a pressure above that of the second stage and the vapor flashed in the first stage is condensed in a mixing condenser by contact with a portion of the liquid of the second stage that is forced into the mixing condenser by its recirculating pump producing the necessary pressure difference between the first

and the second stage, the improvement which comprises throttling means disposed in a flash vapor connecting conduit between the first stage flash vessel and the mixing condenser, by which, in the event of an inadvertent excessive sudden pressure drop in the mixing condenser, occasioned by failure



of the second stage recirculating pump, the resulting pressure decrease of the first stage accompanied by initially increasing evaporation rate in the first stage flash vessel will be thus controlled as to limit said initially increasing evaporation rate to an allowable admissible value.

3,954,567
EVAPORATING SOLUTIONS WHICH CONTAIN PHOSGENE IN A VACUUM LIQUID RING PUMP

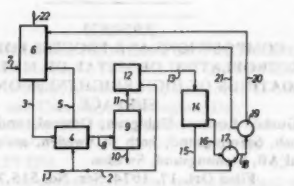
Peter Fischer, Odenthal-Osenau; Wilhelm Hagen, Leverkusen; Helmut Klappert; Walter Levin, both of Cologne; Karl-Friedrich Zenner, and Johannes Werneburg, both of Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 28, 1973, Ser. No. 392,360

Claims priority, application Germany, Aug. 30, 1972, 2242626

Int. Cl.² B01D *3/00*

U.S. Cl. 203—86 **5 Claims**



1. A process for the evaporation in a vacuum of a solution containing phosgene, a solvent selected from the group consisting of liquid hydrocarbons and chlorohydrocarbons with a boiling point under atmospheric pressure of about 100°C and a compound selected from the group consisting of organic isocyanates, chlorocarbonic acid esters and carbonates with a boiling point under atmospheric pressure of above 160°C which is higher boiling than said solvent in which process the vacuum is produced by a vacuum liquid ring pump which uses said phosgene-containing solvent as the sealant fluid at a temperature of −40° to 50°C, and in which the used sealant fluid is returned to the process which generates said solution.

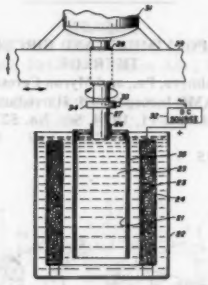
3,954,568
ELECTROFORMING AN ENDLESS FLEXIBLE SEAMLESS XEROGRAPHIC BELT

Donald G. DuPree, Alta Loma, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 7,289, Jan. 30, 1970, abandoned. This application Aug. 8, 1974, Ser. No. 495,612

Int. Cl.² C25D *1/02*

U.S. Cl. 204—9 **7 Claims**



1. A method of making an endless flexible seamless xerographic substrate belt which comprises forming a thin continuous layer of nickel of uniform thickness on the outer surface of a cylindrically shaped rotating mandrel by electrolytic deposition in a nickel containing bath, said mandrel constructed of aluminum having a thin outer layer of chromium, passivated nickel or alternatively of stainless steel and removing the resultant nickel belt from the mandrel by cooling said mandrel.

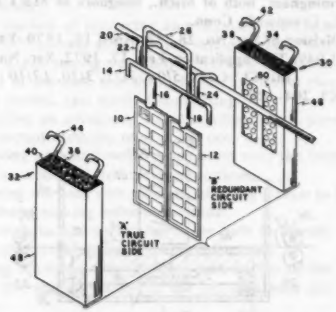
3,954,569
METHOD OF ELECTROFORMING NICKEL ON PRINTED CIRCUIT BOARDS

Ramon D. Vanderveer, Mission Viejo, and William P. Dugan, Ontario, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Division of Ser. No. 395,869, Sept. 10, 1973. This application Dec. 20, 1974, Ser. No. 534,994

Int. Cl.² C25D *5/02*

U.S. Cl. 204—15 **5 Claims**



1. A method of electroforming nickel on a printed circuit board comprising the steps of:

providing a bath of sulfamate nickel plating solution;

immersing a printed circuit board cathode in the plating solution;

immersing a titanium wire anode basket containing nickel chips in the plating solution in an operational relationship to the cathode;

shielding the anode in a non-conductive plastic shield having a plurality of openings disposed in a predetermined pattern on the surface of said shield facing the cathode; and

passing a current through said anode to electrodeposit nickel from said nickel chips on said printed circuit board cathode.

3,954,570

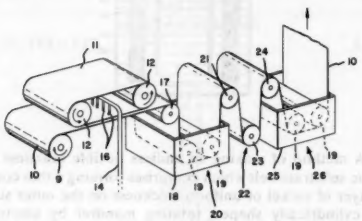
SENSITIZED POLYIMIDES AND CIRCUIT ELEMENTS THEREOF

Albert Shirk, Palmyra, Pa., and Myron Ceresa, Advance, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 11, 1974, Ser. No. 522,807

Int. Cl.² C23C 3/02

U.S. Cl. 204—15 15 Claims



1. A process for depositing an electroless metal on a polyimide, the steps comprising:

a. masking a selected area on a polyimide surface;

b. exposing unmasked portions of said polyimide surface to an open flame;

c. contacting said unmasked and flame sensitized surfaces of said polyimide with a catalyst solution whereby a catalytic amount of a catalyst is deposited on said catalyzed polyimide; and

d. depositing on said catalyzed polyimide surface a metal from an electroless bath solution.

3,954,571

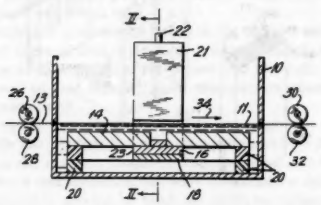
WIRE AND STRIP LINE ELECTROPLATING

Frederick Walter Eppensteiner, Southfield, and R. E. Woehrle, Birmingham, both of Mich., assignors to M&T Chemicals Inc., Greenwich, Conn.

Division of Ser. No. 28,758, April 15, 1970, Pat. No. 3,691,049. This application Feb. 17, 1972, Ser. No. 227,305

Int. Cl.² C25D 5/04, 3/22, 3/30, 17/10

U.S. Cl. 204—28 6 Claims



1. In a method for the high speed wire and strip line zinc and/or tin electroplating of a metallic substrate, the steps which comprise continuously passing elongated portion of said substrate through an electroplating bath, disposing an anode-anode support structure in said bath and spaced apart from said substrate, the anode portion of said structure being the metal to be electroplated and the support portion comprised essentially of at least one member selected from the group consisting of tantalum, niobium and mixtures thereof, and passing a plating current through said anode-anode support structure and said bath to said substrate for the electroplating thereof.

3,954,572

METHOD OF MANUFACTURING AN INTERMETALLIC SUPERCONDUCTOR

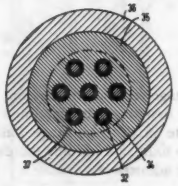
Günther Ziegler, Erlangen; Peter Lanig, Erlangen-Bruck; Erwin Schmidt, Erlangen, and Sigrun Frohmader, Erlangen, all of Germany, assignors to Siemens AG, Munich, Germany

Filed June 5, 1974, Ser. No. 476,449

Claims priority, application Germany, July 3, 1973, 2333893

Int. Cl.² C25D 5/50; H01V 11/00

U.S. Cl. 204—37 T 17 Claims



1. The method of manufacturing a superconductor having a superconductive intermetallic compound consisting of at least two elements comprising the steps of:

a. surrounding a core of at least one ductile element of the compound with a jacket of a ductile matrix material;

b. subjecting the core surrounded by the jacket to a cross section reducing process to form a wire of reduced cross section;

c. applying to the surface of the wire of reduced cross section a sheath consisting of an alloy containing the remaining elements of the compound to be produced and a carrier metal;

d. heat treating the wire and sheath to result in a diffusion of the remaining elements into the matrix and to cause a reaction of the remaining elements wth the core element to form the intermetallic compound.

3,954,573

COMPOSITIONS AND PROCESS FOR THE ELECTROPLATING OF METAL OR METAL ALLOY COATINGS OF HIGH BRIGHTNESS ON A BASE SURFACE

Karl Gustav Lennart Dahlgren, Odsmal, and Frans Adam Kolosh, Stenungsund, both of Sweden, assignors to Berol Kemi AB, Stenungsund, Sweden

Filed Oct. 17, 1974, Ser. No. 515,737

Claims priority, application Sweden, Oct. 18, 1973, 7314211

Int. Cl.² C25D 3/32, 3/56, 3/60

U.S. Cl. 204—43 S 23 Claims

1. An acidic aqueous electroplating bath that upon plating gives coatings of high brightness, high corrosion resistance, and good soldering capacity, comprising a plating compound selected from the group consisting of tin and tin-lead alloy plating compounds supplying tin and lead ion to the aqueous electroplating bath in an amount within the rage of from 5 to about 50 grams per 1000 grams of bath and a 2, 4, 6-substituted phenol of which at least one substituent includes at least one secondary, tertiary or quaternary nitrogen atom, or an alkylene oxide adduct of such phenol in an amount within the range from 0.5 to about 50 grams per 1000 of bath.

3,954,574

TRIVALENT CHROMIUM ELECTROPLATING BATHS AND ELECTROPLATING THEREFROM

Jeffrey Gyllenspetz, Kidderminster, and Stanley Renton, Penkridge, both of England, assignors to Albright & Wilson Limited, Oldbury, England

Filed Dec. 6, 1974, Ser. No. 530,158
Claims priority, application United Kingdom, June 17, 1974, 26665/74; Dec. 13, 1973, 57872/73
Int. Cl.² C25D 3/56, 3/06
U.S. Cl. 204—43 T 30 Claims

24. An aqueous chromium plating solution consisting essentially of water, from 0.2 to 0.6 molar trivalent chromium, from 0.05 to 0.3 molar bromide, formate in a molar ratio of formate to chromium of from 2:1 to 1:1, from 1 to 3 molar ammonium, from 0.5 to 1 molar borate, from 2.5 to 3.5 molar of anion selected from chloride and sulphate and having a pH between 1 and 4.

25. Solution of claim 24 containing from 0 to 6 molar alkali metal cation.

26. The solution of claim 25 containing an effective and compatible amount of a non-brominatable wetting agent.

27. The solution of claim 26 containing up to saturation of a co-depositable metal cation selected from iron, cobalt, nickel, manganese and tungsten.

3,954,575

ZINC ELECTROPLATING

Kazuo Yanagida, Kasukabe; Tethuzi Aoki, Chiba; Akio Takahashi, Kisarazu, and Toshio Igarashi, Tokyo, all of Japan, assignors to Dipsol Chemicals Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 413,673, Nov. 7, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 522,762
Claims priority, application Japan, Nov. 10, 1972, 47-112014
Int. Cl.² C25D 3/22, 3/24
U.S. Cl. 204—55 R 6 Claims

1. A method for the electrodeposition of bright zinc which comprises electrodepositing zinc from an aqueous zinc electrodepositing bath comprising an aqueous solution containing a source of zinc ions and an effective amount, sufficient to yield a bright zinc electrode deposit, of a bath-soluble reaction product prepared by the reaction of at least one epihalohydrin with at least one heterocyclic compound selected from the group consisting of imidazole compounds and pyrrole compounds, wherein 0.5 to 3 moles of said epihalohydrin is reacted per mole of said nitrogen heterocyclic compound at 50°–90°C.

3,954,576

ELECTROLYTIC PROCESS FOR PREPARING TETRAVALENT ALKYLTIN HALIDE COMPOSITIONS

Harris Ellsworth Ulery, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 25, 1974, Ser. No. 491,778
Int. Cl.² C25B 3/12, 11/00; B01K 1/00
U.S. Cl. 204—59 QM 12 Claims

1. A process for preparing at least one tetravalent alkyltin halide having two to three alkyl groups and one to two halide groups per tin atom, comprising electrolyzing a C_1 to C_{10} alkyl halide in contact with a tin cathode, in a liquid electrolyte containing a current-carrier source of halide ions, in an undivided cell at a current density of from 0.02 to 0.2 amp./cm².

3,954,577

ELECTROCHEMICAL PREPARATION OF ALUMINUM BROMIDE

Stephen A. Levine, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 27, 1974, Ser. No. 527,736
Int. Cl.² C25B 1/24
U.S. Cl. 204—59 R 16 Claims

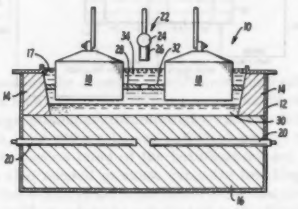
1. An electrolytic process for the preparation of aluminum bromide which comprises providing an electrochemical cell with an aluminum anode, a cathode which is not attacked by hydrogen bromide, aluminum bromide or bromine and an electrolyte consisting essentially of hydrogen bromide in a solvent capable of dissolving hydrogen bromide and aluminum bromide, said electrolyte having below 100 ppm of water, and passing an electric current through the cell in order to initiate a reaction, whereby there is obtained a solution of aluminum bromide.

3,954,578

METHOD FOR PRODUCING ALUMINUM

Paul S. Wrubleski, 2014 E. Hoffman Ave., Spokane, Wash. 99207

Filed Oct. 7, 1974, Ser. No. 512,918
Int. Cl.² C25C 3/06
U.S. Cl. 204—67 4 Claims



1. The method of producing aluminum by the electrolytic reduction of calcined alumina in a liquid cryolite bath containing vertically adjustable carbon anodes through which a direct electric current is passed, said method comprising the following steps:

a. providing an excess amount of liquid cryolite bath,
b. lowering the carbon anodes in the liquid cryolite bath to thereby raise the liquid level of the bath above the normal level of operation,
c. adding alumina ore to the elevated cryolite bath and forming a crust over the top of the bath,
d. raising the carbon anodes to lower the liquid level of the cryolite bath to the normal operating level, and
e. raising the voltage of the electrical current passing through said carbon anodes prior to tapping the molten aluminum.

2. The method of producing aluminum by the electrolytic reduction of calcined alumina in a liquid cryolite bath contained in a pot having vertically adjustable carbon anodes suspended in the bath and through which a direct electrical current is passed, said method comprising:

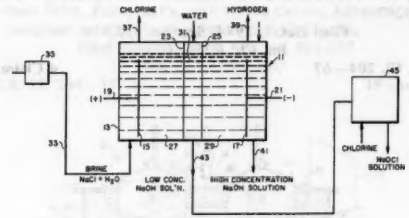
a. providing an amount of liquid cryolite bath in excess of the amount normally used in the pot,
b. breaking up and dissolving any crust over the bath that may have formed from prior operations,
c. covering the bath with alumina, allowing a crust to form, and then breaking holes in the crust,
d. lowering the carbon anodes in the bath to thereby raise the liquid level of the bath above the crust,
e. adding alumina to the cryolite bath on top of the crust until the upper portions of the elevated bath are saturated,
f. raising the carbon anodes to their normal operating position,
g. thereafter periodically charging the cryolite bath with alumina without breaking the crust of saturated cryolite over the bath, and
h. raising the voltage across the pot above normal value for at least four hours prior to the next tapping of the pot.

3,954,579

ELECTROLYTIC METHOD FOR THE SIMULTANEOUS MANUFACTURE OF CONCENTRATED AND DILUTE AQUEOUS HYDROXIDE SOLUTIONS

Edward Cook, Jr., Lewiston, and Alvin T. Emery, Youngstown, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,618
Int. Cl.² C25B 1/16, 1/26
U.S. Cl. 204—98 8 Claims



1. A method for simultaneously producing a dilute aqueous solution of an alkali metal hydroxide and a more concentrated aqueous solution of an alkali metal hydroxide which comprises subjecting an aqueous solution containing 200 to 340 g./l. of an alkali metal halide to electrolysis in an electrolytic cell having at least three compartments therein; said compartments comprise an anode compartment to which the alkali metal halide solution is added, a cathode compartment, and at least one buffer compartment whereby at least two cation-active permselective membranes of a hydrolyzed copolymer of a perfluorinated hydrocarbon and a fluorosulfonated perfluorovinyl ether, or a sulfo-styrenated perfluorinated ethylene propylene polymer, define an anode sidewall and a cathode sidewall of said buffer compartment, said buffer compartment is positioned between said anode compartment and said cathode compartment, and whereby said anode sidewall and said cathode sidewalls of said buffer compartment, with other sidewalls thereabout, define said anode compartment and said cathode compartment; adding water to the buffer compartment in such an amount to be thereby producing and withdrawing a dilute aqueous solution, substantially free of halide ions, containing 60 to 200 g./l. of an alkali metal hydroxide from the buffer compartment while simultaneously producing and withdrawing a more concentrated aqueous solution, substantially free of halide ions, containing 250 to 450 g./l. of an alkali metal hydroxide from the cathode compartment, and maintaining a high caustic current efficiency of 80% or more during the electrolysis.

3,954,580

PROCESSES FOR DECREASING MERCURY BUTTER FORMATION IN MERCURY ELECTROLYTIC CELLS

Chester J. Kaminski, Syracuse, N.Y.; Bruce T. Smith, and Alfred R. Taylor, both of Brunswick, Ga., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,491
Int. Cl. C01d 1/08
U.S. Cl. 204—99 9 Claims

9. The process according to claim 1 wherein said alkali metal hydroxide is sodium hydroxide.

3,954,581

METHOD OF ELECTROLYSIS OF BRINE

William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 22, 1975, Ser. No. 598,506
Int. Cl.² C25B 1/26, 1/02
U.S. Cl. 204—128 15 Claims

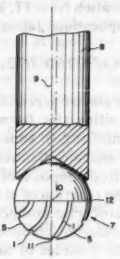
1. In a method of electrolyzing alkali metal chloride brine in a diaphragm cell having an anolyte chamber containing an anode and a catholyte chamber containing a steel cathode, which method comprises feeding the brine to the anolyte chamber, and imposing a voltage across the cell whereby to evolve chlorine at the anode and hydrogen at the cathode, the improvement comprising feeding an hydroxy carboxylic acid chosen from the group consisting of alpha hydroxy carboxylic acids and aromatic hydroxy carboxylic acids and water soluble salts thereof and a phosphorous containing organic compound chosen from the group consisting of organic phosphonates and water soluble salts thereof to the cell.

3,954,582

PROCESS FOR PRODUCING GROOVES IN METALLIC BODIES

Wolfgang Hepp, Immenstaad; Klaus Pimiskern, Friedrichshafen, and Werner Herbert, Markdorf, all of Germany, assignors to Dornier System GmbH, Germany

Continuation-in-part of Ser. No. 373,258, June 25, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,270
Claims priority, application Germany, Aug. 11, 1972, 2239639
Int. Cl.² B29C 17/08; C25F 3/00
U.S. Cl. 204—129.65 1 Claim



1. A process for producing helical oil grooves in a spherical metallic body, for example for a spiral groove bearing,

which comprises exposing a photographic lacquer on the surface of said body to light under a pattern, developing the resulting image, and electrochemically etching and then chemically etching grooves in said body in the non-image areas,

whereby pressure-building spiral grooves are produced having a planar groove bottom, straight walls, sharply right-angled edges, and a depth in the range of about 1 to 20 microns.

3,954,583

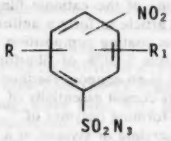
PHOTOCHEMICAL PROCESS

Daniel Lednicer, Portage, and Edward E. Nishizawa, Schoolcraft, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 258,016, May 30, 1972, Pat. No. 3,888,833. This application Mar. 17, 1975, Ser. No. 559,334
Int. Cl.² B01J 1/10, 1/12
U.S. Cl. 204—158 R 1 Claim

1. A process for coating materials which are susceptible to interaction with an aromatic sulfonyl nitrene which comprises

a. contacting the said material with a compound of the generic structure



wherein R and R_1 are the same or different and are selected from the group consisting of hydrogen, halogen, and alkyl of one to four carbon atoms, inclusive;

b. irradiating the said contacted material and compound of step (a) for a time sufficient to generate a nitrene; and

c. converting the nitro group to an amino group.

3,954,584
PHOTOPOLYMERIZABLE VINYLURETHANE LIQUID COMPOSITION

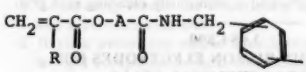
Nobuyoshi Miyata, and Hiroyuki Nakayama, both of Hiratsuka, Japan, assignors to Kansai Paint Company, Amagasaki, Japan

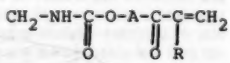
Division of Ser. No. 371,579, June 20, 1973, Pat. No. 3,907,865. This application Feb. 24, 1975, Ser. No. 552,290

Int. Cl.[2] C08F *2/46, 4/00;* **C07C** *125/06*

U.S. Cl. 204—159.23 **8 Claims**

1. A fluid composition comprising a photopolymerizable vinylurethane monomer, a photocopolymerizable ethylenically unsaturated liquid monomer and a photosensitizer, said vinylurethane monomer having a chemical formula

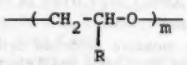




wherein

R represents a hydrogen atom or a methyl group and

A represents an alkyleneoxy group or a polyalkyleneoxy group of the formula



wherein

R is a hydrogen atom or a methyl group and

m is a positive integer of 1 to 11.

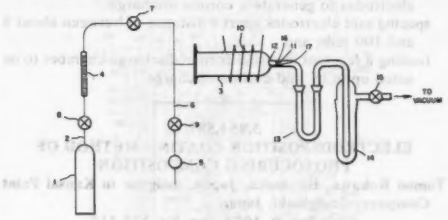
3,954,585
SYNTHESIS OF TRIFLUOROMETHYL-SUBSTITUTED COMPOUNDS

Richard J. Lagow, Manchester; Lois L. Gerchman, Stoneham, both of Mass., and Robert A. Jacob, Grand Forks, N. Dak., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 21, 1974, Ser. No. 444,465

Int. Cl.[2] B01K *1/00;* **C07F** *5/00, 7/00, 17/00*

U.S. Cl. 204—165 **12 Claims**



1. The process for forming a trifluoromethyl-substituted compound which comprises forming a corona discharge or glow discharge plasma of trifluoromethyl radicals from hexafluoroethane, said plasma having sufficient energy to break the carbon-to-carbon bond of the hexafluoroethane but less energy than that needed to cause excessive breaking of carbon-to-fluorine bonds of the hexafluoroethane and contacting said plasma with a substrate substituted with chlorine, bromine or iodine or a carbonylsubstituted metal substrate, to replace said chlorine, bromine, iodine or carbonyl of the substrate with a trifluoromethyl radical said contact being made initially either (a) in the plasma and within a short distance from a downstream visible edge of the plasma or (b) outside of the visible portion of the plasma and within a short distance from said downstream visible edge to effect substitution of the chlorine, bromine or iodine or carbonyl radical of the substrate with a trifluoromethyl radical without substantial decomposition of said substrate and recovering the trifluoromethylated product.

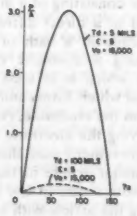
3,954,586
CORONA GENERATOR METHOD AND APPARATUS

Frank E. Lowther, Phelps, N.Y., assignor to Purification Sciences Inc., Geneva, N.Y.

Division of Ser. No. 141,148, May 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 830,248, June 4, 1969, Pat. No. 3,798,457, and a continuation-in-part of Ser. No. 709,485, Feb. 29, 1968, which is a continuation-in-part of Ser. No. 612,751, Jan. 4, 1967, abandoned. This application July 16, 1973, Ser. No. 379,846

Int. Cl.[2] C01B *13/11*

U.S. Cl. 204—176 **14 Claims**



1. The method for generating a corona discharge comprising:

providing a pair of parallel, adjacent, spaced-apart electrodes defining a corona discharge chamber between a facing internal surface of each electrode;

providing at least one of said internal surfaces with a fired-on coating of porcelain enamel dielectric material;

providng a total dielectric thickness for said at least one coating of less than 40 mils;

applying an A.C. voltage having a frequency of between about 60 Hz and 40 KHz and a voltage of between the corona start voltage and 15,000 volts, across said pair of electrodes to generate a corona discharge;

spacing said electrodes apart a distance of between about 5 and 100 mils; and

feeding a reactant into said corona discharge chamber to be acted upon by said corona discharge.

3,954,587
ELECTRODEPOSITION COATING METHOD OF PHOTOCURING COMPOSITION

Tomoo Kokawa, Hiratsuka, Japan, assignor to Kansai Paint Company, Amagasaki, Japan

Filed Jan. 9, 1973, Ser. No. 322,115
Claims priority, application Japan, Jan. 10, 1972, 47-4683
Int. Cl.² C25D *13/06*
U.S. Cl. 204—181 **11 Claims**

1. An electrodeposition coating method of photocuring composition which comprises the steps of:

immersing an electroconductive article into an electrodeposition coating bath which comprises, as the principal ingredients, (a) water soluble or water dispersible film forming polymerizable unsaturated resin having an acid value of 30 to 240, an unsaturation equivalent of about 250 to 2000 and a number average molecular weight of about 1000 to 6000, (b) water insoluble photopolymerization initiator, (c) a polyfunctional unsaturated compound insoluble in water, and (d) water;

forming electrodeposition coating film on the surface of the electroconductive article by supplying electric current to the article as an anode; and

applying actinic rays to the coating film on the article to cause the curing of the coating film by photopolymerization.

3,954,588
ELECTROCOATING PROCESS FOR DEPOSITING A CORROSION RETARDANT LAYER ON A METAL SUBSTRATE AND SEQUENTIALLY ELECTROCOATING A CATIONIC FILM-FORMING POLYMER COATING

Isidor Hazan, Philadelphia; Robert N. Iacona, Newtown Square, and Larry F. Nonemaker, Media, all of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 1, 1974, Ser. No. 510,987
Int. Cl.² C25D *13/06, 13/18*
U.S. Cl. 204—181 **6 Claims**

1. In the process for electrocoating a cationic film-forming polymer composition on a metal electrode of an electrocoating cell, said electrode consisting of a metal article and being electrically connected to a direct current power source, by immersing said electrode in a bath of an aqueous coating composition comprising a synthetic cationic film-forming polymer composition which is at least partially neutralized with an acidic material which forms anions in said bath, electrocoating a coating on the electrode, removing the electrode from the bath and drying the electrode to form a continuous film thereon, the improvement used therewith comprises:

1. immersing the metal article in the bath which is connected to the positive side of the direct current source thereby providing the article with a positive polarity and electrocoating a coating of anions on the surface of the metal article; the anions combine with the surface of the metal article to form a corrosion retardant layer on the metal; and

2. changing the polarity of the metal article by switching to the negative side of the direct current source thereby providing the article with a negative polarity and electrocoating a coating of the cationic film-forming polymer onto the metal article to form a uniform film thereon;

wherein the aqueous coating composition has a pH of about 3 to 8 and comprises 5–50% of film-forming constituents uniformly dispersed in an aqueous medium; wherein the film-forming constituents consist essentially of

a cationic film-forming polymer of

1. an alkyl methacrylate or styrene or a mixture thereof;
2. an alkyl acrylate;
3. an amino alkyl methacrylate or an amino alkyl acrylate; and
4. a hydroxy alkyl acrylate or a hydroxy alkyl methacrylate; and

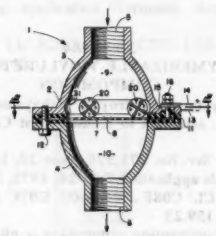
a water-dispersible cross-linking agent;

and contains sufficient phosphoric acid or chromic acid to provide said pH.

3,954,589
PROCESS OF WATER TREATMENT

Henry S. Aber, Cleveland; Dean D. Riggs, Avon Lake, and John Lamantia, Lakewood, all of Ohio, assignors to Water Technology Service, Inc., Cleveland, Ohio

Division of Ser. No. 356,600, May 2, 1973, Pat. No. 3,899,410. This application May 22, 1975, Ser. No. 579,779
Int. Cl.² B03C *5/00;* **C02B** *1/78, 1/82*
U.S. Cl. 204—186 **8 Claims**

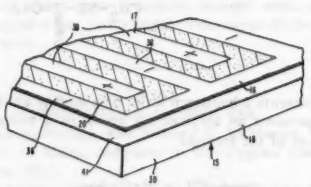


1. A process of eliminating hardness effects of water in a flow path, comprising passing the water through a fitting including an electrically conductive housing and an electrically conductive grid electrically insulatively supported in said housing, applying a voltage between said housing and said grid, and automatically and continuously cleaning said grid.

3,954,590
IRIDIUM THIN RIBBON ELECTRODES FOR ELECTROCHEMICAL CELLS

Michael Czuha, Jr., San Gabriel, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 281,858, Aug. 18, 1972, abandoned. This application Jan. 13, 1975, Ser. No. 540,451
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 W **7 Claims**



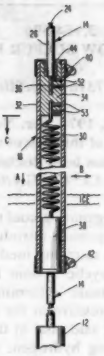
1. An electrolytic moisture detection cell comprising a substrate, spaced apart thin ribbon metal electrodes having a thickness of from about 0.1 to about 1.0 micron attached to and supported by said substrate, said electrodes comprising an anode and a cathode, the cathode being formed of a metal

consisting essentially of iridium or an alloy containing at least 10 weight percent iridium and the remainder platinum; and a hygroscopic film deposited on said substrate and filling at least a portion of the space between said anode and said cathode.

3,954,591
ICE FREE SELF-RELEASING WATER TANK ANODE SUSPENSION SYSTEM

William C. Conkling, Essex Fells, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 9, 1975, Ser. No. 566,477
Int. Cl.² C23F 13/00
U.S. Cl. 204—196 **21 Claims**



10. In combination with a cathodic protection system for protecting a metal water tank subject to subfreezing environmental temperatures from corrosion, wherein at least one anode is provided for protecting said tank from corrosion, the improvement which comprises suspension means apparatus suspending either said at least one anode or a reference cell from the inside roof of the water tank, said suspension means apparatus comprising:

a. first means suspending said suspension means apparatus downward from a suitable structure inside said water tank;
b. second means suspending said at least one anode or said reference cell downward from said suspension means apparatus;
c. connecting means for structurally connecting said first and second means; and
d. flexible protection means aquatically insulating in a watertight compartment said connecting means from water and any ice within said water tank disposed around said connecting means;

wherein said suspension means will self release from any ice layer which forms about said watertight compartment of said flexible protection means upon a change in the level of water supporting said ice layer by said flexible protection means elongating initially in response to vertical movement of said ice layer, said elongation resulting in a reduction in diameter of said flexible protection means thereby resulting in said diameter of said flexible protection means being less than the diameter of the hole in the ice which resulted when ice formed about said watertight compartment of said flexible protection means, resulting in separating of said suspension means from said ice layer.

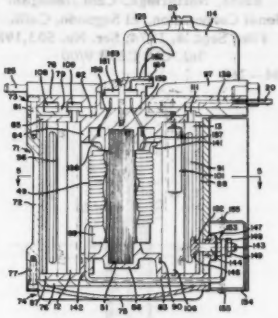
3,954,592
ELECTROLYSIS APPARATUS

Stephen Horvath, St. Ives, Australia, assignor to Beeston Company Limited, Hong Kong

Continuation-in-part of Ser. No. 485,498, July 3, 1974, abandoned. This application Nov. 25, 1974, Ser. No. 527,083
Int. Cl.² C25B 9/04, 11/02, 15/02, 1/04
U.S. Cl. 204—228 **22 Claims**

1. Electrolysis apparatus comprising:

a. an electrolytic cell to hold an electrolytic conductor and including an anode and a cathode to contact the electrolytic conductor, and
b. electrical supply means to apply between the anode and the cathode of the electrolytic cell pulses of electrical energy to induce a pulsating current in the electrolytic conductor wherein the electrical supply means comprises

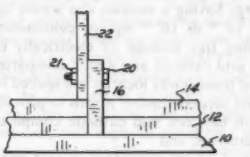


a source of direct current electrical energy of substantially uniform voltage and current and electrical converter means to convert that energy to said pulses, which converter means is such that said pulses as applied between the anode and cathode are each at a greater current value than said uniform current and a lower voltage than said uniform voltage.

3,954,593
METHOD FOR ATTACHING ANODE TO ELECTROLYTIC CELL BOTTOM AND DEVICE THEREFORE

John E. Schmidt, Baton Rouge, La., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation of Ser. No. 175,221, Aug. 26, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,468
Int. Cl.² C25B 9/02, 9/04
U.S. Cl. 204—252 **3 Claims**



1. In a diaphragm-type electrolytic cell for the production of chlorine and caustic alkali from alkali-metal chloride solutions, the improvement comprising:

1. a liner of electrically non-conductive material extending substantially over the bottom of said cell;
2. a single-piece conductive anode-plate-support member having a keyway-channel-shaped anode-receiving means projecting upwardly into the cell through said liner and above said liner interiorly of said cell bottom, said anode-receiving means being above said liner, said anode-plate-support member having non-leaded-in sealing means for maintaining an anode in electrically conductive relationship with said anode-plate-support means; and
3. bus-bar means electrically connected to said anode-plate-support member, said bus-bar means, said anode-plate-support member and said liner having a permanently

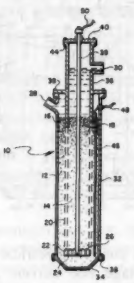
fixed relationship which is not changed or disturbed while removing an anode from said cell.

3,954,594

ELECTROCHEMICAL CELL FOR DECREASING THE CYANIDE AND HEAVY METAL CONTENT OF AN AQUEOUS SOLUTION

Howard L. Recht, Northridge, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 4, 1974, Ser. No. 503,198
Int. Cl.² C25B 9/00
U.S. Cl. 204—263 9 Claims



1. An electrochemical cell for continuously and concurrently reducing the cyanide and heavy metal content of an aqueous solution containing the same, comprising:

a. a cathode compartment having a bed of electrically conductive particles located therein and a first conduit means located adjacent to said bed of particles to provide liquid communication between said cathode compartment and the exterior of the cell;

b. an anode compartment having a bed of electrically conductive particles located therein and a second conduit means located adjacent said bed to provide liquid communication between said anode compartment and the exterior of the cell;

c. an electronically nonconductive substantially water impermeable foraminous member located intermediate and separating said cathode and anode compartments, said foraminous member having a plurality of openings, said openings having a median size within the range of from about 10^{-6} to 10^{-14} square centimeters, said member providing free passage of electrically charged ions between said cathode and anode compartments;

d. a liquid passageway located in a spaced relation from said first and second conduit means to provide liquid communication between said cathode compartment and anode compartment; and

e. electrical means connected to said anode compartment and cathode compartment for maintaining an applied potential to provide passage of a direct electric current therebetween.

3,954,595

COAL LIQUEFACTION

Morgan C. Sze, Upper Montclair, and George J. Snell, Fords, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Mar. 18, 1974, Ser. No. 452,409
Int. Cl.² C10G 1/04
U.S. Cl. 208—8 13 Claims

1. In a process for separating insoluble material from a coal liquefaction product produced from a coal feed and comprised of insoluble material, including coal ash and carbonaceous matter dissolved in a coal liquefaction solvent, comprising:

separating from the coal liquefaction product an essentially solid free stream and a flowable solid containing stream, containing coal derived liquid product and insoluble material, including coal ash, said separation being effected to provide a flowable solid containing stream having an ash content of from 6% to 18%, by weight, and which produces a stripped solid containing stream having Benzene solubles of at least 35 wt. %; and

stripping from said solid containing liquid stream components, including coal derived liquid components, boiling up to about 900°F to produce a stripped solid containing stream having coal derived liquid product and Benzene solubles of at least about 35 wt.%.

3,954,596

PRODUCTION OF LOW SULFUR HEAVY OIL FROM COAL

Wilburn C. Schroeder, 7316 Radcliffe Drive, College Park, Md. 20740

Filed June 3, 1974, Ser. No. 476,105
The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.
Int. Cl.² C10G 1/06
U.S. Cl. 208—10 14 Claims

1. A process for hydrogenating coal to provide a low sulfur, heavy oil product, comprising introducing said coal in the substantial absence of a slurrying medium into a hydrogenation zone of a closed cyclic system having hydrogenation, purifying and oxygen-steam reforming zones, said system being maintained at a pressure in the range of about 500 to 2000 psi, hydrogenating said coal in the hydrogenation zone with hot gases containing hydrogen, carbon monoxide and steam at a temperature in the range of about 820° to 1000°F. and with a contact time of no more than a few minutes, the reaction conditions being correlated to provide an effluent stream containing excess hydrogen, heavy liquid and gaseous hydrocarbons and gaseous impurities including sulfur, removing the heavy liquid hydrocarbons from said effluent stream without substantial reduction in system pressure, removing sulfur from the resulting effluent gas stream in said purifying zone without substantial reduction in system pressure, introducing the resulting hydrogen and hydrocarbon gas stream into said reforming zone, reforming said hydrocarbons in said zone with oxygen and steam to provide said hot gases containing hydrogen, carbon monoxide, and steam and introducing the hot gases from the reforming zone into the hydrogenation zone to complete the cycle.

3,954,597

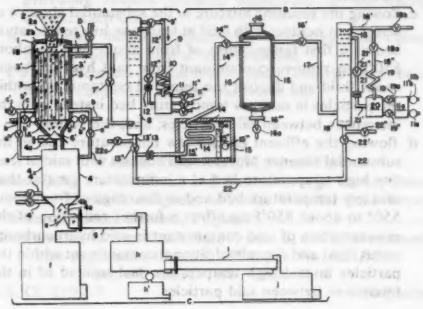
PROCESS FOR THE PRODUCTION OF DISTILLATE FUELS FROM OIL SHALES AND BY-PRODUCTS THEREFROM

Jacque C. Morrell, 4501 Connecticut Ave., NW. Apartment 516, Washington, D.C. 20008

Filed Mar. 27, 1974, Ser. No. 455,074
Int. Cl.² C10G 1/00
U.S. Cl. 208—11 R 6 Claims

1. A continuous process for the production of distillate fuels, including motor fuels, domestic burning oils, diesel fuels, jet fuels and the like, from oil shales; which comprises heating a feed consisting essentially of oil shale in subdivided form to a conversion temperature; passing the conversion products, including hydrocarbon oil vapors and gases to a fractionating zone, wherein there is removed a light overhead product comprising hydrocarbon gases, water and ammonia, and wherein the primary heavier conversion products from the oil shale are condensed and separated as a liquid as a first stage in the process; passing the said condensed heavier oil products through a separate heating zone maintained under cracking and conversion conditions of elevated temperatures and pressures of 100 to 250 pounds and discharging the same into an enlarged conversion zone which is also maintained under cracking conditions of elevated temperatures and pres-

sures of 100 to 250 pounds wherein cracking and conversion of the higher boiling to lower boiling products is continued to increase the yield thereof and to produce coke; passing the oil vapors and gases from the enlarged conversion zone to a



dephlegmator wherein an overhead fraction consisting essentially of a pressure distillate in the boiling range of gasoline, domestic heating oils, diesel fuels, and jet fuels is removed, and the remaining bottoms fraction is recycled to said separate heating zone maintained under said cracking conditions.

3,954,598
PURIFICATION OF AQUEOUS UREA SOLUTIONS IN A UREA DEWAXING PROCESS

Hermann Franz, Neu Isenburg, and Max Kunert, Neu Wulmstorf, both of Germany, assignors to Edeleanu Gesellschaft m.b.H., Germany

Continuation of Ser. No. 218,515, Jan. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 29,253, April 16, 1970, abandoned. This application Apr. 28, 1975, Ser. No. 572,685

Claims priority, application Germany, Apr. 18, 1969, 1919663

Int. Cl.[2] C07B *21/00;* **C10G** *43/04*

U.S. Cl. 208—25 **6 Claims**

1. A process for the purification of an aqueous solution contaminated with a quantity of an oily phase comprising a mixture of hydrocarbons and dichloromethane, said solution obtained as a portion of the aqueous phase of the filtrate following removal of a solid adduct of urea and normal paraffins in a urea dewaxing process of the type utilizing a concentrated aqueous urea solution to form the adduct, which comprises:

a. admixing an effective amount, sufficient to substantially remove the oily phase contamination, of dichloromethane with the aqueous urea solution containing the oily phase contamination,

b. filtering the resultant mixture,

c. allowing the mixture to settle forming two layers,

d. separating the layers to yield a lower layer comprising dichloromethane and a quantity of the oily phase contamination and an upper layer comprising aqueous urea solution having a substantially reduced oil phase contamination content.

3,954,599
PROCESS FOR PRODUCING CRACKED GAS AND CRACKED OIL FROM HEAVY HYDROCARBONS

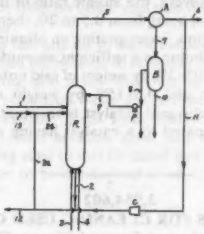
Isami Ooka, Neyagawa, Japan, assignor to Osaka Gas Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 367,225, June 7, 1973, abandoned. This application Mar. 5, 1974, Ser. No. 448,187

Claims priority, application Japan, Mar. 7, 1973, 48-27524

Int. Cl.[2] C10G *9/30*

U.S. Cl. 208—89 **10 Claims**



1. In producing cracked gas and cracked oil by thermally cracking a heavy hydrocarbon within a reactor into the lower portion of which are introduced steam and oxygen so as to flow countercurrently to a moving bed comprising a granular solid, a process which comprises supplying the heavy hydrocarbon to the upper portion of the reactor from above the moving bed, discharging part of the granular solid from the bottom of the reactor and thereafter feeding it again to the upper portion of the reactor, to thereby maintain the upper portion of said reactor at a temperature of up to 550°C.

3,954,600
CATALYTIC CRACKING PROCESS FOR PRODUCING MIDDLE DISTILLATE

Elroy M. Gladrow, and Daniel F. Ryan, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 15, 1974, Ser. No. 442,738

Int. Cl.[2] C10G *37/06;* **B01J** *8/24*

U.S. Cl. 208—119 **9 Claims**

1. In a catalytic cracking process wherein a gas oil boiling in the range of about 600° to 1050°F. is converted to lower boiling hydrocarbon products by contacting said gas oil with a cracking catalyst under cracking conditions including a temperature ranging from about 800° to 1000°F. in a conversion zone, the improvement which comprises conducting said contacting step in the presence of an added normally liquid olefin-containing naphtha containing less than about 30 volume percent aromatics, said naphtha containing at least 10 volume percent normally liquid olefins, the volumetric ratio of said naphtha to said gas oil ranging from 20:80 to 40:60, to produce an increased amount of middle distillate components.

3,954,601
PROCESS FOR HYDROGENATING AROMATIC HYDROCARBONS ON SULFUR RESISTANT CATALYSTS

Jean Cosyns, Nanterre; Germain Martino, Poissy, and Jean-Francois Le Page, Rueil-Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Aug. 7, 1974, Ser. No. 495,428

Claims priority, application France, Aug. 16, 1973, 73.29940

Int. Cl.[2] C10G *23/04*

U.S. Cl. 208—143 **15 Claims**

1. In a process for hydrogenating an aromatic hydrocarbon containing sulfur compounds as impurities, wherein said aromatic hydrocarbon and hydrogen and contacted with a cata-

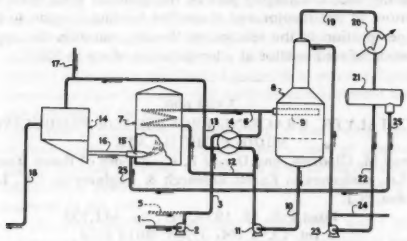
lyst consisting essentially of (a) a noble metal selected from the group consisting of platinum, iridium, rhodium and ruthenium, (b) an alumina carrier, and (c) fluorine or chlorine,

wherein the improvement comprises using as said catalyst a catalyst manufactured by a process comprising the essential steps of (1) reacting a compound of a noble metal selected from the group consisting of platinum, iridium, rhodium and ruthenium with a reducing agent of the formula $AlXyR_{3-y}$, wherein y is 1, 1.5 or 2, X is fluorine or chlorine and R is a monovalent hydrocarbon radical, in an organic solvent, the atomic ratio of the noble metal to the aluminum being from 0.5 to 20, thereby producing a catalyst solution, impregnating an alumina carrier with said catalyst solution in a sufficient amount to provide the catalyst with 0.05–3% by weight of said noble metal based on the carrier, and 0.5–15% by weight of chlorine or fluorine, whereby said catalyst is resistant to sulfur poisoning as compared to a catalyst having no chlorine or fluorine.

3,954,602
PROCESS FOR CLEANING USED OILS

André Troesch, Paris, and Fernand Cleron, Chelles, both of France, assignors to Societe Parisienne des Lubrifiants Nationaux et des Entrepots d'Hydrocarbures, Aubervilliers, France

Filed Feb. 20, 1974, Ser. No. 444,549
Claims priority, application France, Mar. 1, 1973, 73.07275
Int. Cl.² C10M *11/00*
U.S. Cl. 208—179 **6 Claims**



1. A process for cleaning used engine oils and industrial lubricating oils, comprising, (a) heat treating the used oil in a heat treatment zone at a temperature of 352°–400°C at a pressure of 1–6 bars for a period of at least 15 minutes, continuously withdrawing treated oil from said heat treatment zone, (b) re-heating a first portion of said treated oil to the treatment temperature and recycling the re-heated first portion of said treated oil to said heat treatment zone at a re-cycling rate in the range of 5 to 20, (c) separating the sedimentary residues from a second portion of said heat treated oil and (d) burning said residues from step (c) for re-heating said first portion of said treated oil in step (b).

3,954,603
METHOD OF REMOVING CONTAMINANT FROM HYDROCARBONACEOUS FLUID

Daniel J. Curtin, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 10, 1975, Ser. No. 548,512
Int. Cl.² C10G *29/04*
U.S. Cl. 208—253 **13 Claims**

1. A method of removing a contaminant comprising at least one of arsenic and selenium from a hydrocarbonaceous fluid comprising the steps of:

a. preparing a plurality of beds comprising at least one low temperature bed and at least one high temperature bed, each bed having essentially only porous particles therein which contain a contaminant-removing material selected from the group consisting of iron, cobalt, nickel, at least one oxide of the named metals, at least one sulfide of the named metals, and combinations of two or more thereof; said material being operable to effect removal of at least a portion of said contaminant from said hydrocarbonaceous fluid under a reducing atmosphere at a temperature of from about 300° to about 850°F;

b. mixing said hydrocarbonaceous fluid with a reducing medium;

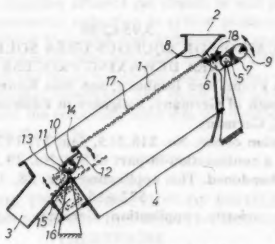
c. flowing the resulting mixture in the substantial absence of water into contact with said at least one low temperature bed at a first temperature of from about 300° to about 550°F to remove contaminant from said hydrocarbonaceous fluid and deposit the removed contaminant within the particles in said low temperature bed instead of in the interstices between said particles; and, thereafter,

d. flowing the effluent of said low temperature bed in the substantial absence of water into contact with said at least one high temperature bed at a temperature greater than said low temperature bed and in the range of from about 550° to about 850°F to effect a further reduction of the concentration of said contaminant in said hydrocarbonaceous fluid and deposit additional contaminant within the particles in said high temperature bed instead of in the interstices between said particles.

3,954,604
SIFTING MACHINE

Rudolf Krause, Dornholzhausen, and Günter Erlenstaedt, Remscheid, both of Germany, assignors to "Rhewum" Rheinische Werkzeug- u. Maschinenfabrik GmbH, Remscheid-Luttringhausen, Germany

Filed Aug. 9, 1971, Ser. No. 169,931
Claims priority, application Germany, Aug. 7, 1970, 2039335; Mar. 16, 1971, 2112577
Int. Cl.² B07B *1/30*
U.S. Cl. 209—325 **8 Claims**



7. A sifting machine, comprising in combination:

a. a rectangular sieve screen having a first end and a second end, the length of the sieve screen being greater than its width, said length extending between said first and second ends, said sieve screen being inclined in a direction extending downwardly from said first end toward said second end, said first end being the inlet end of the sieve screen and said second end being the outlet end of the sieve screen;

b. a first vibration generator operatively connected to said first end, said first vibration generator having means for imparting a vibration of relatively low frequency and relatively high amplitude to said first end in a direction having a component perpendicular to the plane of said sieve screen;

c. a second vibration generator operatively connected to said second end, said second vibration generator having means for imparting a vibration of relatively high frequency and relatively low amplitude to said second end

in a direction having a component perpendicular to the plane of said sieve screen;

d. one of said vibration generators being an eccentric motor;

e. a first clamp located at the first end of the sieve screen and being attached thereto;

f. a second clamp located at the second end of the sieve screen and being attached thereto;

g. spring means connected to at least one of said clamps for providing relative yielding movement of the clamps toward each other;

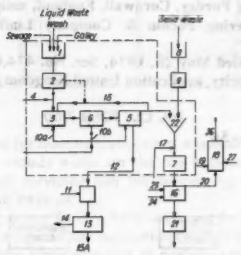
h. a frame including means for mounting said clamps thereto adjacent said screen ends and

i. a transverse bar on said frame, said eccentric motor being fixedly connected to said transverse bar.

3,954,605
WASTE TREATMENT PLANTS

Robert John Davies, Kent, and Dennis George Blows, Essex, both of England, assignors to Foster Wheeler John Brown Boilers Limited, London, England

Continuation of Ser. No. 312,559, Dec. 6, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,708
Int. Cl.[2] C02C *1/08*; C02B *1/36*
U.S. Cl. 210—7 **10 Claims**



1. A method of disposing of domestic sewage wastes and solid materials in a remotely situated land site or on board a ship employing a fluidized bed incinerator wherein said solid material is selected from the group consisting of combustible solid material, noncombustible solid material, and mixtures thereof; which comprises:

A. passing the sewage wastes into a reception zone;

B. passing said sewage wastes, after being collected in said reception zone, to a macerator, and macerating said sewage wastes in said macerator;

C. introducing flocculating aids to said sewage wastes after said sewage wastes have been macerated in said macerator;

D. passing said sewage wastes to a pressure aeration zone and dissolving air under pressure into said sewage wastes;

E. then passing said sewage wastes to a flotation zone and liberating fine air bubbles therein and thereby transporting flocculated solid particles to the surface of the flotation zone and thereby separating said sewage wastes into a pulp capable of being fed to a fluidized bed incinerator, and a clarified liquor;

F. disinfecting said clarified liquor and then reusing said clarified liquor in said remotely situated land site or on board said ship or passing it to the fluidized bed incinerator;

G. returning part of said pulp to said pressure aeration zone;

H. passing said pulp which has not been returned in step (G) to a feeding zone of said incinerator;

I. passing said solid materials to a pulverizing zone and therein converting said solid material to an incineratable form in which said solid material is capable of being fed to the fluidized bed region of said fluidized bed incinerator;

J. providing combustion conditions in said fluidized bed incinerator;

K. passing said solid materials to said feeding zone;

L. mixing said pulp and said solid materials in said feeding zone of said incinerator;

M. feeding the mixture obtained in step (L) directly to the fluidized bed region of said fluidized bed incinerator;

N. introducing any waste oil from said remotely situated land site or from on board said ship into said fluidized bed incinerator;

O. supplying fuel and air to said fluidized bed region of said fluidized bed incinerator to maintain combustion therein;

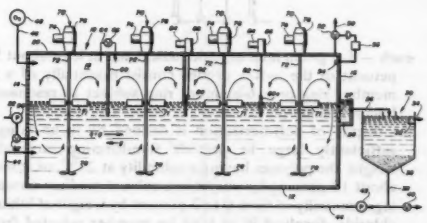
P. incinerating said solids and pulp in said incinerator to provide deodorized waste gas and sterile ash; and

Q. passing exhaust gases from said reception zone, said macerator, said aeration zone, said flotation zone, and said feeding zone to said fluidized bed incinerator or to an afterburner to be deodorized to an inoffensive gas.

3,954,606
WASTEWATER TREATMENT SYSTEM WITH CONTROLLED MIXING

Charles S. Block, Allentown; Michael S. Chen, Macungie, and Olaf J. Noichl, Whitehall, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 12, 1973, Ser. No. 414,770
Int. Cl.[2] C02C *1/02*
U.S. Cl. 210—14 **14 Claims**



1. The method of oxygenating and reducing the bioligical oxygen demand of a mixed liquor comprising the steps of:

a. flowing said mixed liquor through an elongated, non-partitioned liquid zone of an aeration basin; said liquid zone being non-partitioned throughout at least 80% of the depth of said mixed liquor;

b. introducing oxygen-rich aeration gas into said aeration basin;

c, oxygenating said mixed liquor with said oxygen-rich aeration gas by rotating a plurality of surface aerators positioned at spaced locations along the length of said elongated, non-partitioned liquid zone;

d. providing surface baffles between at least some of said surface aerators and maintaining the depth of penetration of said surface baffles into said mixed liquor within the range of 2 to 20% of the depth of said mixed liquor; and

e. controlling the backflow ratio of the mixed liquor between adjacent aerators to produce effective liquid staging in the order of 30 to 80% or more by maintaining the aerator mixing factor $N \times D/U$ within the range of 10 to 550; where N is the RPM of the surface aerators, D is the diameter of the surface aerators, and U is the liquid linear velocity through the non-partitioned liquid zone.

3,954,607
PERMSELECTIVE MEMBRANES OF DIACYL HYDRAZIDE-CONTAINING AROMATIC POLYMERS HAVING SELECTED METALS COMPLEXED THEREWITH

Robert Allen Halling, Wilmington, Del., assignor to E. I. Du Pont de nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 249,210, May 1, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 497,048

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—23 H **17 Claims**

1. A permselective polymeric asymmetric membrane comprising

i. a diacyl hydrazide-containing, substantially linear, aromatic, synthetic organic polymer comprising alternating linking groups and organic radicals, and

ii. one or a mixture of Co(II), Ni(II), Cu(II) and Pd(II) metal wherein the metal is in square planar coordination complex relationship with the polymer of (i),

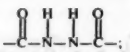
the permselective membrane characterized by having metal complexed with the polymer in the amount of at least one-gramatomic weight of metal for each 20 gram-formula-weights of linking groups,

the polymer of (i) being further characterized by having the formula

$$(\text{-L-R-})_n$$

wherein

the —L— groups and —R— radicals are alternating, each —L— group is a linking group and at least about 50 percent of the —L— groups contain a nitrogen atom in the polymer chain, and at least 5 percent of the —L— groups contain the diacyl hydrazide group



each —R— group is an organic radical and at least about 50 percent of the —R— groups consist essentially of a 5-member ring or a 6-member ring subject to resonance bonding; and

the degree of polymerization is defined by n, an integer sufficiently large to provide film-forming molecular weight; the polymer having a solubility at 25°C. of at least about 10 percent by weight in a solvent medium consisting essentially of from 0 to 3 percent by weight of lithium chloride dissolved in at least on member selected from the group consisting of dimethylacetamide, dimethyl sulfoxide, N-methylpyrrolidone and hexamethylphosphoramide.

3,954,608
METHOD AND DEVICE FOR RAPID CHROMATOGRAPHIC SEPARATION

Patrick Valentin, Pont Eveque, France, assignor to Entreprise de Recherches et d'Activities Petrolieres ELF, Paris, France

Filed Aug. 13, 1974, Ser. No. 497,105

Claims priority, application France, Aug. 17, 1973, 73.30063

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—24 C **11 Claims**

1. A method of rapid chromatographic separation by exchange of substances between two fluid phases circulating in countercurrent flow, at least one phase being liquid, the separation of the substances between said two phases being distinguised by high selectivity together with high productivity, wherein said method comprises injecting the substances to be separated into one of the phases, causing the two phases to circulate on each side of a porous body having a thickness within the range of 1 to 200 microns while limiting the thickness of at least one liquid phase to a constant value within the range of 0.1 to 100 microns, and collecting after circulation

the substances which have been separated in each of the two phases.

3,954,609
PARTICULATE SOLID MATERIALS

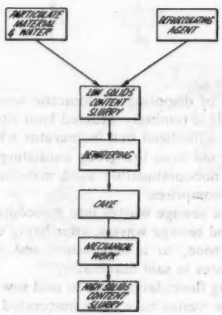
John Anthony Purdey, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, Cornwall, England

Filed May 28, 1974, Ser. No. 474,069

Claims priority, application United Kingdom, May 29, 1973, 25609/73

Int. Cl.[2] F26B *7/00*

U.S. Cl. 210—54 **9 Claims**

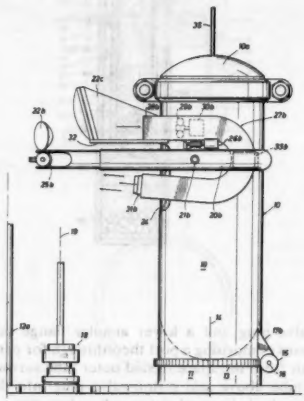


1. In a process for preparing an aqueous slurry of satin white containing at least about 50% by weight of solids from a mixture comprising satin white and water, the process comprising the steps of deflocculating the mixture with a chemical deflocculating agent to form a first aqueous slurry containing from about 20 to 35% by weight of solids and dewatering said first aqueous slurry by pressure filtration at a pressure of at least 250 psig to form a cake having a reduced water content as compared with said mixture, the improvement which comprises subjecting said cake to mechanical work which comprises at least one cycle of applying a stress to the cake and relaxing the applied stress without the addition of any further water to form a second aqueous slurry of satin white containing at least about 50% by weight of solids.

3,954,610
METHOD AND SUBSURFACE WORK CHAMBER FOR MAKING TRANSPARENT AN UNDERWATER CLOUDY WORK AREA

Ivo C. Pogonowski, Blacksburg, Va., and Paul D. Carmichael, Houston, Tex., assignors to Texaco, Inc., New York, N.Y.

Division of Ser. No. 355,115, April 27, 1973, Pat. No. 3,854,296. This application Aug. 19, 1974, Ser. No. 498,344
Int. Cl.² B01D *37/00*; B63C *11/00*
U.S. Cl. 210—65 **6 Claims**



1. A method for making transparent a subsurface work area covered with cloudy water on the sea bottom adjacent to a subsurface well servicing and life supporting work chamber comprising the steps of,

a. ingesting water from a level adjacent to the subsurface well servicing and life supporting work chamber,

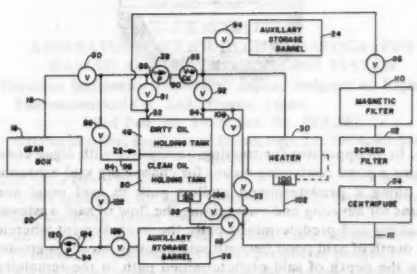
b. filtering the ingested water to provide clear water, and

c. ejecting the clear water into the cloudy water covered work area at a level below the ingesting level to displace the cloudy water with the clear water to provide a transparent water covered work area.

3,954,611
PORTABLE APPARATUS AND METHOD FOR PURIFYING LUBRICATING OIL IN VARIOUS DEVICES

Elvie L. Reedy, 3617 London Lane, Fort Worth, Tex. 76118

Filed Jan. 29, 1975, Ser. No. 545,085
Int. Cl.² B01D *17/04*
U.S. Cl. 210—71 **4 Claims**



2. An apparatus for purifying lubricating oil in devices such as pumping units, gearboxes, and the like at a plurality of geographically separated locations comprising:

a tank for holding dirty oil;

a tank for holding clean oil;

a tank containing new oil;

a flow-through heater for heating oil;

control means for operating the heater to heat the oil between 150° and 175° F;

a filtering system comprising in series, a magnetic filter for removing metallic particles from the oil, a screen for removing particles from the oil, a centrifuge for removing water and solids from the oil, and a fine particle filter for removing smaller particles from the oil;

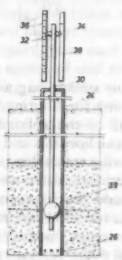
pump, valve and conduit means coupling said elements of said system for selective:

1. connection to and transferring oil from a device to said dirty oil tank;
2. flowing the oil in said dirty oil tank through said heater whereby the temperature of said oil is raised to a temperature of 150° to 175° F.;
3. circulating the oil in said dirty oil tank through said filtering system whereby said oil is cleaned;
4. transferring the oil leaving said filter system to said clean oil tank;
5. flowing the oil in said clean tank through said heater whereby said oil temperature can be raised to 150° to 175° F.;
6. connection to and transferring oil from said clean oil tank to said device; and
7. transferring oil from said new oil tank to said device.

3,954,612
SEPTIC TANK SYSTEM

Anderson L. Wilkerson, Rte. 4, Box 57, Temple, Tex. 76501

Filed June 26, 1974, Ser. No. 483,219
Int. Cl.² G01F *23/06*
U.S. Cl. 210—86 **2 Claims**



1. A septic tank system comprising a septic tank having an inlet to receive sewage and an outlet located just below the top of the septic tank through which the liquid effluent from the tank can flow, a tributary connected to the outlet to receive the effluent and to allow the effluent to soak into the ground, said tributary comprising an elongated ditch that is filled with gravel or the like to about the top of the outlet, means located in the tributary for indicating above the surface of the ground the level of effluent in the tributary, said indicating means including a first vertical conduit extending from above the surface of the ground to the bottom of the ditch forming the tributary, said conduit having openings therein and screen means associated with said openings having a mesh size selected to permit liquid to enter the conduit but to prevent the gravel in the ditch from entering the pipe to allow effluent in the tributary to flow into the conduit to the level of the effluent in the tributary, a float located in the conduit to float in the effluent in the conduit, and means attached to the float and extending above the ground surface to indicate the effluent level in the tributary, and means through which excess effluent may be pumped directly out of the tributary before it causes sewage to back up in the inlet to the septic tank, said

means through which the excess effluent may be pumped including a second conduit extending from the surface of the ground through the gravel to about the bottom of the tributary, said second conduit having perforations adjacent the bottom thereof and screen means associated with said perforations having a mesh size selected such that the gravel in the ditch cannot enter the conduit while liquid effluent can to allow the effluent to be pumped out of the tributary to substantially remove all of the liquid effluent from the ditch.

3,954,613

FILTER APPARATUS

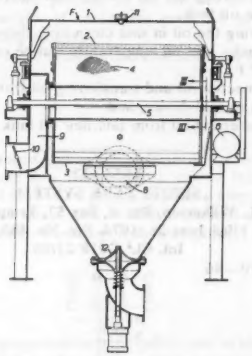
Ronald Frederick Worlidge, "High Ridge", 9 Durlston Road, Parkstone, Poole, Dorset, England

Filed Oct. 17, 1973, Ser. No. 407,082

Claims priority, application United Kingdom, Oct. 18, 1972, 48028/72

Int. Cl.² B01D *33/02*

U.S. Cl. 210—108 **17 Claims**



1. A filter apparatus comprising a housing, a filter screen disposed in said housing for filtering liquid carrying solids to remove at least some of the solids from the liquid, nozzle means disposed in said housing and arranged adjacent said filter screen for removing solids deposited on said filter screen during a filtering operation, drive means for causing relative movement between said filter screen and said nozzle means such that in use deposited solids are removed from successive portions of said filter screen, means for causing liquid to flow from the side of said filter screen remote from said nozzle means back through said filter screen into said nozzle means, and means for adjusting the flow of liquid back through said filter screen into said nozzle means, said nozzle means comprising an elongated nozzle positioned laterally of the direction of said relative movement, and said adjusting means comprising elongated members defining an elongated inlet to said nozzle, the relative positions of said elongated members being adjustable for adjusting the width of said elongated inlet, said elongated members being shaped to cooperate closely with the adjacent surface of said filter screen so as to inhibit the flow of liquid into said nozzle directly from the side of the filter screen on which nozzle is disposed.

3,954,614

SERUM SKIMMER AND FILTER SEPARATION UNIT

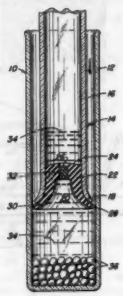
Hershel Earl Wright, Decatur, Ill., assignor to Glasrock Products, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 276,782, July 31, 1972, abandoned. This application Dec. 4, 1973, Ser. No. 421,517

Int. Cl.² B01D *35/02*

U.S. Cl. 210—136 **7 Claims**

1. A separation unit comprising an outer tube with a lower closed end, a plunger tube longitudinally movable within said outer tube, a resilient piston-valve plug seated in the inner end of said plunger tube, said plug comprising a tubular body portion seated in the inner end of said plunger tube, an upper head portion having a slit therethrough for permitting the flow of liquid from the space in said outer tube below said piston-valve plug into the space in said plunger tube above said



piston-valve plug and a lower annular flange portion with valve means comprising a port therethrough for permitting the flow of air from the space in said outer tube surrounding said plunger tube above said piston-valve plug into the space in said outer tube below said piston-valve plug when said plunger tube is moved outwardly of said outer tube.

3,954,615

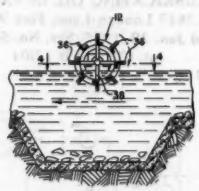
APPARATUS FOR SEWAGE TREATMENT AND WASTEWATER RECLAMATION

Gedaliahu Shelef, Kiron, Israel, assignor to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel, a part interest

Division of Ser. No. 236,267, March 20, 1972, Pat. No. 3,839,198, which is a continuation-in-part of Ser. No. 109,263, Jan. 25, 1971, abandoned. This application Feb. 28, 1974, Ser. No. 446,924

Int. Cl.² C02C *1/04*

U.S. Cl. 210—170 **11 Claims**

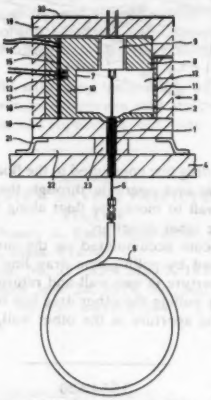


1. In an apparatus for treating wastewater with algae comprising a pond containing means for channeling said wastewater along a predetermined endless path in said pond and means for aerating and maintaining the flow of said wastewater along said predetermined path, the improvement wherein the depth of said pond beneath said aeration means is greater than the depth of said predetermined path in the remaining portions of said pond, said greater depth being sufficient to provide a solubility gradient which increases the amount of oxygen than can be dissolved into the liquid by said aeration means.

3,954,616
CHROMATOGRAPHIC APPARATUS

Richard Jarmany Hunt, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 17, 1973, Ser. No. 397,660
Claims priority, application United Kingdom, Sept. 18, 1972, 43080/72
Int. Cl.² B01D *15/08*
U.S. Cl. 210—198 C **4 Claims**



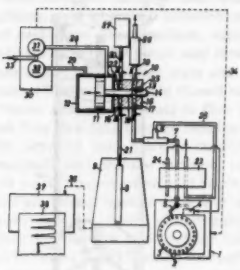
1. Chromatographic apparatus, comprising:
a chromatographic separation column;
a detector responsive to components eluted from said column;
an insulated column oven surrounding said chromatographic separation column for maintaining said column at a predetermined temperature;
an insulated detector oven surrounding said detector for maintaining said detector at a higher predetermined temperature than said column, said ovens being spaced from each other by an air gap;
a conduit connecting said column to said detector for conveying components from said column across said air gap to said detector;
a thermally conductive sheath in thermal contact with said detector oven and surrounding said conduit at least over the portion of said conduit traversing said air gap; and
thermal insulation surrounding the exterior of said sheath at least over the portion thereof traversing said air gap,
whereby said sheath substantially prevents negative thermal gradients along said conduit from said column to said detector.

3,954,617
APPARATUS FOR LIQUID CHROMATOGRAPHY HAVING AUTOMATIC SAMPLING SYSTEM

Toyohisa Ishimatsu, Toyonaka, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 26, 1975, Ser. No. 553,352
Claims priority, application Japan, Feb. 27, 1974, 49-23085
Int. Cl.² B01D *15/08*
U.S. Cl. 210—198 C **6 Claims**

1. An apparatus for liquid chromatography having an automatic sampling system comprising:
an intermittently rotatable circular table means having a number of sample cups on its peripheral portion,
a wash liquor receptacle disposed close to said circular table means,
a withdrawing member means for being reciprocally movable between said wash liquor receptacle and one of said sample cups respectively brought to a specified position by said intermittent rotatable circular table means and then for being held in position for a specified period of time to withdraw the samples and the wash liquor alternately,
a sample supply tube having the withdrawing member connected thereto,
a sample discharge tube,
a column including a column tube in communication therewith,
a developer supply tube means for supplying developer,
a pump means associated with said supply tube means
a sampling valve comprising a hydraulic cylinder, a piston rod formed in its peripheral surface with an annular groove means for accommodating therein a definite amount of the sample, and a body fixed to a front end of said cylinder with said piston rod extending through said body, said body having an inner surface defining a rod bore slidably receiving said piston rod,
parallel first and second passage means intersecting said rod bore and spaced apart from each other by a distance corresponding to a stroke of said piston rod, each of said passage means being in the form of a bore extending through said body and having a diameter smaller than the diameter of said piston rod, said first passage means for communicating with said sample supply tube at one end and with said sample discharge tube at the other end, said second passage means having one end communicating with said developer supply tube means and the other end communicating with said column tube in communication with said column, said inner surface of said body defining the rod bore being formed with a liquid passing annular groove at the intersection of said rod bore and each of said passage means.



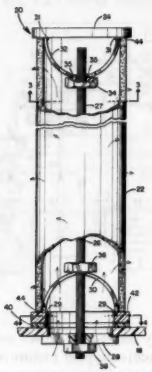
3,954,618
FILTER TUBE HOLDER AND FILTER ASSEMBLY

Richard Strauss, Lexington, Mass., assignor to Whatman Reeve Angel Limited, Maidstone, England

Filed Dec. 23, 1974, Ser. No. 535,366
Int. Cl.² B01D *29/10*
U.S. Cl. 210—232 **12 Claims**

1. A filter tube assembly which comprises in combination:
a. a closed housing which includes
i. an inlet to introduce a fluid stream to be filtered into the interior of the housing,
ii. an outlet to remove the filtered fluid stream from the interior of the housing, and
iii. a mounting plate within the housing to separate the inlet and outlet in a fluid-tight manner, the plate characterized by at least one filter tube passageway therein; and
b. a filter tube holder to secure a filter tube to filter the fluid stream about the filter tube passageway, which holder comprises

i. a first closed end cap having an inner face surface,
ii. a second end cap with an opening therein having upper and lower face surfaces, and arranged circumferentially about the opening of the filter tube passageway to form a fluid-tight seal between the lower face surface and the circumferential surface of the passageway,
iii. a rod element having a one end and another end, and arranged to be positioned within the filter tube, and which extends through the filter tube passageway,
iv. means to secure the first end cap to the one end of the rod element,
v. a mounting bar arranged on the opposite side of the filter tube passageway of the plate from the first end cap, arranged to extend across the passageway, and characterized by a central opening into which the other end of the rod element extends, and which bar permits flow of the fluid stream through the passageway,



vi. a first arcuate strip element characterized by a central opening therein through which the rod element extends, and constructed and arranged to be located within the filter tube, with the opposite ends of the arcuate strip secured to the inner circumference of the second end cap and less than the inner diameter of the filter tube, which arcuate strip permits flow of the fluid stream within the filter tube, and
vii. wherein the means to secure the first end cap or the mounting bar includes means to move the mounting bar or first end cap, or both, axially along the rod element, whereby a filter tube may be held in a fixed position between the upper face surface of the second end cap and the lower face surface of the first end cap, and in a fluid-tight manner about the filter tube passageway of the mounting plate, with the mounting bar securing the holder to the mounting plate.

3,954,619

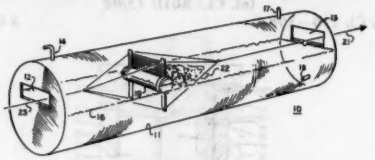
SCUM DRAG

Lucius John Fry, 1223 N. Nopal St., Santa Barbara, Calif. 93103

Filed May 6, 1975, Ser. No. 574,856
Int. Cl.² E02B *15/04*
U.S. Cl. 210—242 S **1 Claim**

1. In combination with an enclosed elongated tank for use as a methane generator normally having a liquid pool therein, having parallel side walls at the pool surface, and having an apertured front-end wall at one end of the pool and an apertured rear-end wall at the other end of the pool, a scum drag comprising:

a. a transverse float having a dimension transverse to the elongated tank substantially the same as the transverse dimension of the surface of the liquid pool and having a front toward the front-end wall and a rear toward the rear-end wall of the tank;
b. a vertical fence secured to the top of the float;
c. a front drag line connected to the float on the front side of the float and operable through the aperture in the front-end wall to move the float along the length of the pool in one direction;



d. and a rear drag line connected to the float on the rear side of the float and operable through the aperture in the rear-end wall to move the float along the length of the pool in the other direction;

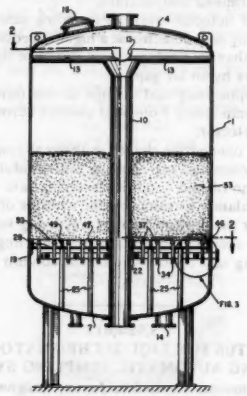
whereby any scum accumulated on the surface of the pool may be removed by pulling one drag line in one direction through the aperture in one wall and returning the drag to a rest position by pulling the other drag line in the other direction through the aperture in the other wall, said scum being removable.

3,954,620

FILTRATION AND BACKWASHING APPARATUS FOR USE WITH A WATER FILTRATION SYSTEM

Rostislav Nebolsine, New York, N.Y., assignor to Hydrotechnic Corporation, New York, N.Y.

Filed Oct. 25, 1974, Ser. No. 517,862
Int. Cl.² B01D *23/18*
U.S. Cl. 210—275 **1 Claim**



1. Improved filtering and backwashing apparatus for a filter bed used in a fluid filtration system having support means for said filter bed, the improvement comprising:

a first plenum area positioned below and common to said entire filter bed;
a plurality of second plenum chambers, each of said second chambers being positioned above said first plenum area and below said filter bed;
a structural deck, said deck positioned intermediate said first plenum area and said second plenum chambers;
a plate positioned intermediate said filter bed and said second plenum chambers, said plate having openings

providing fluid communication between said filter bed and said second chambers;

a plurality of nozzles being positioned within said structural deck, each of said nozzles having an outer circumferential wall, a top end, a bottom end, a first portion extending above said structural deck into one of said plurality of second plenum chambers and a second portion extending below said structural deck into said first common plenum area, said nozzle first portion being an outer circumferential wall having openings formed therein, and said nozzle top end being closed and supporting said plate, said nozzle second portion being an outer circumferential wall having a slot formed therein, said nozzle bottom end being closed;

a plurality of ribs extending transversely of said filter bed and being positioned between said structural deck and said plate, said ribs supporting said plate.

3,954,621

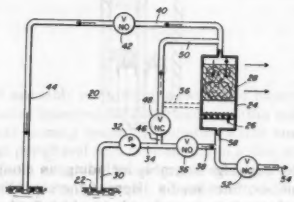
FILTRATION SYSTEM HAVING PREFILTER AND MAIN FILTER

Kenji Etani, and Nancy A. Etani, both of W. Meadow Road, West Townsend, Mass. 01474

Continuation of Ser. No. 357,839, May 7, 1973, abandoned. This application June 24, 1974, Ser. No. 482,245

Int. Cl.² B01D *23/24*

U.S. Cl. 210—314 **1 Claim**



1. A filtration system comprising:

a. a housing including a fixed body and a detachable head, said head having an inlet port, said fixed body having a backwash port and an outlet port;

b. a prefilter medium mounted within said housing between said fixed body and said detachable head adjacent said inlet port, said prefilter medium readily removed from said housing by detaching said head, said prefilter medium composed of an open-celled polymeric foam, at least ninety percent of the pore sizes of said prefilter medium being in the range of 0.05 to 0.0005 inch;

c. a main filter medium mounted within said body adjacent said outlet port, said main filter medium spaced from said prefilter medium, a chamber formed between said main filter medium and said prefilter medium, said backwash port communicating with said chamber, said main filter medium composed of an open-celled polymeric foam, at least ninety percent of the pore sizes of said main filter medium being in the range of 0.05 to 0.0005 inch;

d. said prefilter medium and said main filter medium disposed in a flow path of a fluid, said main filter medium spaced downstream of said prefilter medium, said prefilter medium having a thickness in the direction of said flow which is less than one-tenth the thickness of said main filter medium in the direction of said flow, the thickness of said prefilter medium in the direction of said flow path being no greater than one-half inch in the direction of said flow path;

e. pump means for causing said fluid to flow;

f. first control means including first conduit means, said first control means having opened and closed states, said first control means communicating with said pump means and said inlet port via said first conduit means;

g. second control means including second conduit means, said second control means having opened and closed states, said second control means communicating with said pump means and said backwash port via said second conduit means;

h. third control means including third conduit means, said third control means having opened and closed states, said third control means communicating with said first control means and said inlet port via said third conduit means, said third conduit means communicating with a waste stream; and

i. fourth control means including fourth conduit means, said fourth control means having opened and closed states, said fourth control means communicating with said outlet port via said fourth conduit means;

j. said pump means causing said fluid to flow successively in a filtration flow direction through said inlet port, said prefilter medium, said chamber between said prefilter medium and said main filter medium, said main filter medium, and said outlet port when said first and fourth control means are in said opened state and said second and third control means are in said closed state;

k. said pump means causing said fluid to flow successively in a backwash flow direction through said backwash port, said chamber between said prefilter medium and said main filter medium, said prefilter medium, and said inlet port into said waste stream when said second and third control means are in said opened state and said first and fourth control means are in said closed state, said backwash flow direction through said prefilter medium being opposite said filtration flow direction through said prefilter medium, backwashing and replacement of said prefilter medium readily effected for prolonged life of said main filter medium, said relatively thin prefilter medium operative to capture only particles larger than the pore sizes and to pass particles smaller than the pore sizes.

3,954,622

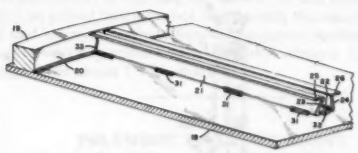
SEALING MEANS FOR DIVIDER STRIPS ON FILTER DRUMS

Ernest Ryszard Kus, Norwalk, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Continuation of Ser. No. 364,628, May 29, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,266

Int. Cl.² B01D *33/08*

U.S. Cl. 210—404 **4 Claims**



1. In a rotary vacuum drum filter provided with filtration chambers adjoining one another about the periphery of a drum cylinder, whereby filter cake is formed and held upon the filter media on said filtration chambers except where the vacuum is broken in a filter cake discharge zone at the descending side of the drum,

the combination which comprises said drum cylinder provided with end trunnions, and with a rim surrounding each end of the cylinder in sealed relationship therewith, a plurality of divider strips in the form of channel members extending parallel to the cylinder axis, endwise between said rims in sealing relationship therewith, said channel members being spaced from one another to constitute said filtration chambers between them and between said rims,

said channel members being of U-shaped sheet metal profile having an arched bottom face of a concavity facing the drum cylinder surface, said channel member thus having longitudinal bottom edge portions supported on said cylinder surface, and constituting with the drum cylinder surface a longitudinal duct of a cross-sectional area defined by the concavity of said arched bottom face of the channel member and by the drum surface, said arched bottom face thus forming with the drum cylinder surface a pair of opposedly directed nips internally along each bottom edge portion of the channel member,

a strand of plastically deformable sealing substance contained in said shallow duct along the length thereof, and deformed so as to sealingly occupy said duct,

and weld connections provided between the drum cylinder surface and said bottom edge portions of the channel member, said weld connections being spaced apart along said longitudinal bottom edges, whereby the channel member is fixed to the drum surface, and whereby the pressure differential occurring between any two mutually adjoining filtration chambers passing through said filter cake discharge zone, is adapted to wedgingly force said deformable sealing substance into tight sealing relationship with the nip extending along the respective bottom edges of said channel members.

3,954,623

BLOOD FILTRATION UNIT

Kurt Finn Hammer, Camarillo; James Beattie Henderson, Westlake Village; George William Lane, Camarillo, all of Calif.; William Lauer, Madison, N.J.; Alfred Robert Luceyk, Santa Paula, Calif., and Francis Martin Servas, Belle Mead, N.J., assignors to Johnson & Johnson, New Brunswick, N.J. and Purolator, Inc., Del.

Filed May 28, 1974, Ser. No. 473,479
Int. Cl.² B01D *27/06, 39/08*
U.S. Cl. 210—436 **8 Claims**

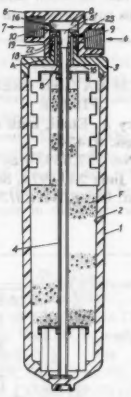
1. A blood filtration unit comprising a housing for a filter cartridge, a blood inlet disposed from said housing, one end of said inlet extending away from said housing and attachable to a reservoir for blood, a filter cartridge disposed in said housing, said cartridge comprising a top end cap, a bottom member, and an elongated filter media having a hollow center core sealed between said top cap and bottom member said filter media being selected from the group consisting of woven fabrics, nonwoven fabrics, foam materials, and combination thereof, said top end cap being solid and having a multipointed configuration, said filter media having substantially the same cross-sectional shape as the top end cap, the outside diameter of the top end cap as measured at the points being substantially the same as the inside diameter of the housing, said bottom member having a centrally located blood outlet, one end of said outlet connecting with the hollow core of the filter media, the other end of said outlet being adaptable to a blood administration set, and said housing being secured to said bottom member at the periphery of said bottom member.

3,954,624

FILTER CARTRIDGE ASSEMBLY

Raymond M. Petrucci, Middlebury, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 17, 1974, Ser. No. 461,562
Int. Cl.² B01D *27/00*
U.S. Cl. 210—439 **7 Claims**



1. A filter cartridge assembly including: an elongated cylindrical chamber; filter media disposed therein; closure means affixed to the top portion of said chamber; fluid stream connecting means disposed in said fluid stream line having integrally formed inlet and outlet ports; said fluid stream connecting means being adapted to be cooperatively positioned with respect to said cylindrical chamber; cartridge connecting means integrally formed of said closure means for positioning said cylindrical chamber containing said filter media in cooperative working relationship with said fluid stream connecting means; tubular means disposed within said cylindrical chamber, being in communication with said cartridge connecting means for allowing the passage of fluid therethrough and into said outlet port in said fluid stream connecting means; passage means formed by said fluid connecting means for allowing the passage of fluid into said chamber interior; first sealing means affixed to said cartridge connecting means extending in a radial direction serving to seal the inlet and outlet fluid streams passing through said fluid stream connecting means; said first sealing means being defined by a feathered edge portion having associated therewith a flat undercut surface further defining a passage between said cartridge connecting means and said fluid stream connecting means to allow the passage of fluid into the inlet port of said cartridge connecting means, said undercut surface serving to provide additional dynamic force on said first sealing means to further enhance sealing at the contact surfaces between said first sealing means and said fluid stream connecting means; second sealing means disposed beneath said first sealing means serving to provide frictional sealing between said fluid stream connecting means and said closure means; central passage means formed in said closure means connected to said tubular portion and extending into and through said cartridge connecting means to thereby form an outlet passage means from the interior of said cylindrical chamber to and through the outlet port of said fluid stream connecting means; and fluid inlet passage means ex-

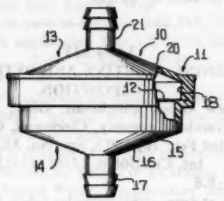
tending from an inlet passage in said cartridge connecting means to the chamber interior allowing the passage of inlet fluid through to the chamber interior.

3,954,625

FILTER AND METHOD OF FORMING SAME

David E. Michalski, Elk Grove Village, Ill., assignor to Plastisonics Company, Inc., Chicago, Ill.

Filed Sept. 27, 1974, Ser. No. 509,958
Int. Cl.² B01D 35/00
U.S. Cl. 210—445 7 Claims



1. A filter assembly comprising a two piece housing assembly and a planar intermediate filter screen within said housing assembly, said housing assembly including a first housing part having a first peripheral wall terminating in a first continuous support surface, a second housing part having a second peripheral wall forming generally a continuation of said first peripheral wall and terminating in a second continuous support surface opposing said first support surface, said filter screen having a continuous peripheral portion disposed between said support surfaces, and a peripherally continuous portion of one of said support surfaces extending through said filter screen peripheral portion and forming a continuous heat bonded seal with the other of said support surfaces, said first peripheral wall having integrally connected thereto a third peripheral wall telescoped over said second peripheral walls outwardly of said filter screen, and there being a continuous bond between an outer surface of said second peripheral wall and an inner surface of said third peripheral wall.

3,954,626

WELL TREATING COMPOSITION AND METHOD

George K. Greminger, Jr., Midland, Mich.; Carl P. Strange, Walker, La., and Samuel A. Pence, Jr., Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 24, 1973, Ser. No. 400,278
Int. Cl.² E21B 43/26
U.S. Cl. 252—8.55 R 14 Claims

1. In a method for fracturing a subterranean formation penetrated by a wellbore which comprises injecting down the wellbore and subjecting to fracturing pressure an essentially anhydrous mixture comprising liquid carbon dioxide and an alkanol of 1 to 3 carbon atoms gelled to a viscosity of at least 10 centipoises with a cellulose ether compound, the improvement which comprises employing as gelling agent a hydroxypropyl methylcellulose having a methoxyl D.S. of from about 0.2 to about 1.0 and a hydroxypropoxyl M.S. of at least about 1.2 and wherein the sum of said D.S. and M.S. is at least about 1.8.

3,954,627

LAMELLAR MICELLE CONTAINING COMPOSITIONS WHICH EXHIBIT RETRO-VISCOUS PROPERTIES

Karl D. Dreher, Littleton, Colo., and William B. Gogarty, Findlay, Ohio, assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 375,293, June 29, 1973, abandoned. This application Nov. 7, 1973, Ser. No. 413,462
Int. Cl.² C09K 7/02; E21B 43/26
U.S. Cl. 252—8.5 P 13 Claims

1. A composition containing lamellar micelles having an axial ratio of at least 3.5 and which is substantially optically clear, substantially phase stable, exhibits birefringence, and exhibits a substantial increase in flow rate at minor increase in pressure drop while the fluid is under flow conditions at a certain pressure, the composition having a viscosity of at least 75 cps. at a shear rate of 10 sec^{-1} and is comprised of about 30 to about 70% of a liquid hydrocarbon, about 15 to about 66% of water, and about 4 to about 15% of surfactant which is a sulfonate having an average equivalent weight of 350 to about 525, or a carboxylate having an average equivalent weight of about 200 to about 500, the percents based on weight.

3,954,628

PREPARATION OF SEA WATER MUDS USEFUL FOR EARTH DRILLING OPERATIONS

Charles A. Sauber, and Louis E. Roper, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 26, 1973, Ser. No. 418,913
Int. Cl.² C09K 7/02
U.S. Cl. 252—8.5 A 6 Claims

1. A method for preparing a sea water based well drilling mud which comprises adding to sufficient sea water to maintain the mud as a fluid, sufficient clay material to form a filter cake on the wall of the well and two water soluble sodium carboxymethyl celluloses, the first being a low viscosity polymer having a degree of substitution of about 0.9 or higher, a Brookfield viscosity of about 400 to about 3100 centipoise as a 2 percent solution in distilled water at 25°C and the second, which is added after the first has been completely added being a sodium carboxymethylcellulose which has a degree of substitution of 0.9 or higher and a Brookfield viscosity of greater than about 10,000 centipoise as a 2 percent solution in distilled water at 25°C said two water soluble sodium carboxymethyl celluloses being added in a total amount sufficient to reduce the water loss due to filtration through said filter cake but insufficient to increase the viscosity of said drilling mud to such an extent that it cannot be desirably circulated, the ratio of said lower viscosity sodium carboxymethylcellulose to said higher viscosity sodium carboxymethylcellulose being in the range from about 1:7 to about 3:1.

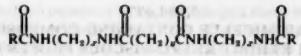
3,954,629

POLYMERIC DIVERTING AGENT

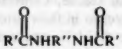
John W. Scheffel, Fullerton, and Paul W. Fischer, Whittier, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed June 3, 1974, Ser. No. 475,511
Int. Cl.² C09K 7/02; E21B 43/26
U.S. Cl. 252—8.5 LC 6 Claims

1. A well treating composition comprising discrete solid particles having a mean diameter of from about one-half inch to about 1 micron of a homogeneous mixture of (1) about 5 to 25 weight percent of a polymer selected from the group consisting of polyethylene having a melt index of less than 100 grams in 10 minutes, ethylene-vinyl acetate copolymer containing about 15 to 30 weight percent of vinyl acetate having a melt index of from about 1 to about 500 grams per 10 minutes, and admixtures of said polymers; (2) about 8 to 50 weight percent of a polyamide having a melting point between about 400° and 460° F. characterized by the formula:



wherein R is an alkyl radical containing from 15 to 18 carbon atoms, *x* is an integer from 2 to 4, and *y* is an integer from 4 to 10; and (3) about 40 to 50 weight percent of a polyterpene resin having a melting point between about 230° and 275° F. or about 60 to 70 weight percent of an aliphatic diamide having a melting point between about 280° and 300° F. characterized by the formula:



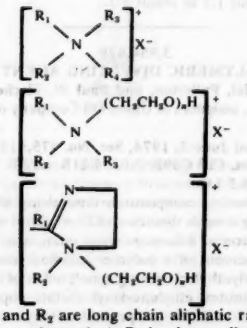
wherein R' is an alkyl radical containing from 15 to 18 carbon atoms and R'' is an alkylene radical containing from 2 to 4 carbon atoms.

3,954,630
POST-WASH FABRIC TREATING COMPOSITION AND METHOD

Pallassana Ramachandran, Robinsville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 286,995, Sept. 7, 1972. This application Oct. 15, 1974, Ser. No. 514,755
Int. Cl.² B08B *3/00*
U.S. Cl. 252—8.6 **9 Claims**

1. A post-washing composition adapted to be diluted with water consisting essentially of an organic complexing acid, a quaternary ammonium softening agent and water, said organic complexing acid and said softening agent being present in a concentration sufficient so that upon dilution, the concentration of organic complexing acid is from 0.01 to 0.1% by weight and the concentration of said softening agent is from 0.01 to 0.1% by weight, said organic complexing agent selected from the group consisting of citric acid, maleic acid, tartaric acid, fumaric acid, adipic acid, succinic acid and mixtures thereof and being operative to substantially reduce yellowness imparted to fabrics by said cationic softening agent, said softening agent being selected from the group of compounds having the following formulas



wherein R_1 and R_2 are long chain aliphatic radicals having 8 to 22 atoms, or alternatively R_2 is a lower alkyl radical having 1 to 4 carbon atoms, R_3 and R_4 are lower alkyl radicals, n is a number between 1 and 15 and X is a water soluble salt forming anion.

3,954,631
SPIN FINISH FOR TEXTURED CARPET YARN

Robert Moore Marshall, Chester, and John Irving Scott, Richmond, both of Va., assignors to Allied Chemical Corporation, Petersburg, Va.

Filed Aug. 9, 1974, Ser. No. 495,950
Int. Cl.² D06M *13/30*
U.S. Cl. 252—8.7 **2 Claims**

1. A spin finish for polyamide yarn to be processed at high temperature, said finish being an oil in water emulsion of about 4 to 20 percent by weight of said oil portion, said oil portion consisting essentially of

a. tridecyl stearate in an amount of from about 40 to 60 percent by weight,
b. polyethylene glycol (10) oleate in an amount of from about 20 to 30 percent by weight, and
c. sulfonated petroleum product in an amount of from about 20 to 30 percent by weight.

3,954,632
SOFTENING ADDITIVE AND DETERGENT COMPOSITION

Robert Andrew Gloss, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 16, 1973, Ser. No. 333,104
Int. Cl.² D06M *13/46*, *11/12*
U.S. Cl. 252—8.8 **3 Claims**

1. A detergent-compatible granular fabric softening composition consisting essentially of:

a. from about 5 to about 90% by weight of a smectite clay having an ion-exchange capacity of at least 50 meq/100 grams;
b. from about 1 to about 40% by weight of a substantially water-insoluble quaternary ammonium anti-static agent of the formula:

wherein R_1 and R_2 represent hydrocarbyl groups containing from about 10 to about 22 carbon atoms, R_3 and R_4 represent hydrocarbyl groups containing from 1 to about 4 carbon atoms, X is an anion and *n* is an integer from 1 to 3; and

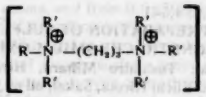
c. from about 1% to about 40% by weight of an acid compatibilizing agent to avoid affixing the quaternary compound to the surface of the clay said agent being selected from the group consisting of:
i. fatty acids having from about 8 to about 30 carbon atoms in the alkyl chain;
ii. compounds selected from the group consisting of benzene mono-, di- and tricarboxylic acid containing from 0 to 2 hydroxyl functions; and
iii. mixtures of the above-described compounds.

3,954,633
ANTISTATIC AND LUBRICATING AGENTS FOR THE PROCESSING OF FIBERS

Gustav Dollinger, Egelsbach; Ulrich Cuntze, Hofheim, Taunus, and Rolf Kleber, Neu-Isenburg, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 10, 1974, Ser. No. 487,314
Claims priority, application Germany, July 13, 1973, 2335675
Int. Cl.² D06M *13/36*, *13/46*
U.S. Cl. 252—8.8 **2 Claims**

1. A liquid antistatic fiber lubricating agent essentially consisting of 20 to 50% by weight of a compound of the formula



in which R is alkyl or alkenyl of 8 to 20 carbon atoms, the R' are identical or different lower alkyls and X is chloride, lower alkylsulfate or tosylate and of 50 to 80% of weight of water.

3,954,634

STABLE, LOW-VISCOSITY FABRIC SOFTENER

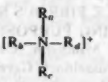
James A. Monson; Wendy L. Stewart, both of Racine, and Harold F. Gruhn, Sturtevant, all of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 383,215, July 27, 1973, abandoned. This application July 12, 1974, Ser. No. 488,120
Int. Cl.² D06M *13/46*
U.S. Cl. 252—8.8 **7 Claims**

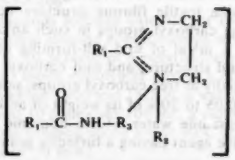
1. Process for producing an aqueous, storage stable, fabric-softening dispersion having an initial viscosity under 150 centipoises, which comprises:

a. Pre-mixing a mixture consisting essentially of:

1. 7 to 15 percent by weight of a cationic fabric softening agent selected from a quaternary ammonium compound of the formula:



wherein R_a and R_b are alkyl groups having 12 to 22 carbon atoms; R_c and R_d are alkyl groups having from 1 to 6 carbon atoms and X^- is an anion imparting water dispersibility to said compound; and imidazolinium compound having the formula:



wherein R_1 is an aliphatic hydrocarbon radical having from 12 to 22 carbon atoms; R_2 is an alkyl group having 1 to 6 carbon atom; R_3 is a divalent alkylene group having 1 to 3 carbon atoms and X is an anion imparting water dispersibility to said imidazolinium compound, and mixtures thereof;

2. and from 1 to 10 percent by weight of an aliphatic alcohol selected from the group consisting of methanol, ethanol, propanol, isopropanol, butanol, isobutanol and t-butanol;

with from 74.5–92 percent by weight of an aqueous vehicle substantially free of electrolytes and consisting essentially of water, at a temperature from 65°F. to a temperature above the softening point of said fabric softening agent, with sufficient agitation to provide a creamy, gel-like emulsion free of entrapped air;

b. mixing said creamy, gel-like emulsion at high shear pressure from about 500 to 8000 p.s.i. at a temperature above the softening point of said fabric softening agent to provide a thin, substantially translucent, stable dispersion; and

c. thereafter immediately cooling said stable dispersion to a temperature less than 80°F to prevent agglomeration of said dispersed particles and to insure a stable dispersion.

3,954,635

POLYGLYCOLIC ACID FIBER FINISH AND METHOD

Percival W. Cummings, Jr., Brookfield; John H. Goodman, III, Danbury, both of Conn.; Arthur Glick, Dorado, P.R.; James B. McPherson, Jr., Cos Cob, and Edward J. McCusker, Danbury, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 23, 1974, Ser. No. 535,936
Int. Cl.² D06M *13/22*
U.S. Cl. 252—8.9 **6 Claims**

1. A hydrophobic, biologically innocuous, fiber finish for absorbable glycolic acid polymer fiber consisting essentially of a xylene solution of a mixture of (1) from about 20% to about 80% of a pharmaceutical grade light mineral oil having an API Gravity of from about 31.1 **to about** 40.2, a Specific Gravity at 25°C. (USP) of from about 0.824 to about 0.870, a Viscosity at 100°F., SSU of from about 48 to about 105 and a Refractive Index at 25°C. of from about 1.456 to about 1.469 and, correspondingly, (2) from about 80% to about 20% of sorbitan monolaurate, said percentages being by weight based on the total weight of (1) and (2), the concentration of said mixture in said solution ranging from about 3% to about 25%, by weight, based on the total weight of the solution.

3,954,636

ACIDIZING FLUID FOR STIMULATION OF SUBTERRANEAN FORMATIONS

Curtis W. Crowe, Tulsa, and Bob D. Baker, Oklahoma City, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 30, 1973, Ser. No. 393,107
Int. Cl.² E21B *43/27*
U.S. Cl. 252—8.55 C **6 Claims**

1. An acidizing composition for stimulating the flow of fluid from subterranean formation which comprises:

a. a mixture of from about 2 to about 40 per cent by weight of an acid which is characterized as being able to dissolve at least a portion of the subterranean formation; water from about 5 to about 65 per cent by weight, and a lower alkyl alcohol in which said acid is soluble and in which carbon dioxide is soluble to an extent greater than the solubility of carbon dioxide in water from about 30 to about 95 per cent by weight; and

b. from about 200 to 100,000 standard cubic feet of liquid carbon dioxide per 1000 gallons of the mixture defined in paragraph (a) above.

3,954,637

METHOD AND COMPOSITION FOR LUBRICATING AND LUBRICATED SUBSTRATES

Robert P. Pardee; Archie L. Bickling, Jr., and Thomas J. Loran, all of Boulder, Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Division of Ser. No. 373,577, June 25, 1973, Pat. No. 3,862,860. This application Sept. 20, 1974, Ser. No. 507,826
Int. Cl.² C10M *5/00, 7/00*
U.S. Cl. 252—12 **8 Claims**

1. A method of forming a lubricant composition, comprising: combining a copolymer of trifluorochloroethylene and vinyl chloride, a tetrafluoroethylene telomer and a solvent for the copolymer and telomer, and separating the undissolved copolymer and telomer from the lubricant composition.

3,954,638

STORAGE-STABLE GREASE COMPOSITIONS

John A. Jones; Alexander C. B. MacPhail; Charles B. Milne, all of Wirral, and Kenneth M. Riches, Sandiway, all of England, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 24, 1975, Ser. No. 561,572

Claims priority, application United Kingdom, Mar. 26, 1974, 13282/74

Int. Cl.[2] C10M *1/24, 3/18, 1/54, 3/48*

U.S. Cl. 252—40 9 Claims

1. A grease composition comprising a major amount of a mineral lubricating oil thickened to a grease consistency having incorporated therein from about 0.5 to about 3% by weight of a crude solid N—C_{7-8} hydrocarbyl substituted phenothiazine inhibitor produced by (1) reacting phenothiazine in an inert petroleum hydrocarbon solvent with a molar excess of up to 25% of finely-divided alkali metal hydroxide at a temperature of from about 110°to about 210°C with removal of the water formed in the reaction, (2) reacting the resultant alkali metal salt of phenothiazine with a molar excess of up to 10% of hydrocarbyl halide of 7–8 carbon atoms, (3) treating the resultant mixture with a solid selective adsorbent followed by simultaneous removal of said adsorbent and the alkali metal halide formed, and (4) removing said inert solvent and recovering a solid product without further purification.

6. The composition of claim 1 wherein the lubricating oil is thickened to grease consistency by use of a lithium soap.

3,954,639

LUBRICATING OIL COMPOSITION CONTAINING SULFATE RUST INHIBITORS

Thomas V. Liston, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 14, 1974, Ser. No. 451,258

Int. Cl.[2] C10M *1/38*

U.S. Cl. 252—47.5 18 Claims

1. A lubricating composition of improved rust inhibitory capacity comprising a major amount of an oil of lubricating viscosity and a rust inhibiting amount of the sulfate of a polyoxyalkylenated alcohol or polyoxyalkylenated phenol or the sulfate salt thereof, said sulfate having a molecular weight in the range of from about 500 to about 5,000 and said sulfate salt being prepared by contacting said sulfate with the basic amine compound selected from ammonia, a primary or secondary alkyl monoamine, an alkanol amine, an alkylene polyamine or a succinimide of alkylene polyamine.

3,954,640

ELECTROSTATIC PRINTING INKS

Chin H. Lu, Webster, and David A. Allen, Sodus, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 27, 1973, Ser. No. 374,159

Int. Cl.[2] C03G *9/00*

U.S. Cl. 252—62.1 L 16 Claims

1. An ink composition comprising about 3–20 percent coloring agent, about 25–90 percent inert, non-volatile, organic carrier, about 3–25 percent organic resin having a glass transition temperature of about ambient temperature or below and a particle size of 5 microns or less dispersed in and insoluble in said carrier, and 0 to about 25 percent dispersing agent.

3,954,641

PROCESS FOR THE PREPARATION OF SULFUR MODIFIED FERROMAGNETIC CHROMIUM OXIDE

Tadashi Kawamata, Settsu; Toshihiro Mihara, Hirakata; Yukio Terada, Osaka, and Eiichi Hirota, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 181,581, Sept. 17, 1971, abandoned.

This application Aug. 31, 1973, Ser. No. 393,467

Claims priority, application Japan, Sept. 22, 1970, 45-83150

Int. Cl.[2] C01G *37/02*

U.S. Cl. 252—62.51 4 Claims

1. A method for making a ferromagnetic chromium oxide powder consisting essentially of

61.84 to 53.08 weight percent of chromium

0.05 to 5.00 weight percent of sulfur

0.10 to 10.00 weight percent of tellurium,

said method comprising: heating a powdered mixture consisting essentially of CrO_3 and TeS_2 in amounts to effect said chromium oxide under a pressure of oxygen or oxygen and water vapor of 50 to 1000 atmospheres at a temperature of 250° to 480°C.

3. A method for making a ferromagnetic chromium oxide powder comprising heating a powdered mixture consisting essentially of CrO_3 and sulfur in a ratio of 5 weight parts of CrO_3 to 0.0042 to 0.4670 weight parts of sulfur; under a pressure of 50 to 1000 atmospheres at a temperature of 250° to 480°C.

3,954,642

IMPREGNATED TEXTILE FIBROUS STRUCTURES FOR CLEANING PURPOSES

Milan Johann Schwuger, Monheim, Germany, assignor to Henkel & Cie GmbH, Dusseldorf, Germany

Filed Nov. 23, 1973, Ser. No. 418,725

Claims priority, application Germany, Dec. 2, 1972, 2259137

Int. Cl.[2] C11D *17/00*

U.S. Cl. 252—91 19 Claims

1. A textile fibrous structure impregnated with a nonionic surface-active agent and suitable for cleaning purposes comprising a water-insoluble textile fibrous structure having a content of salt-forming carboxyl groups in such an amount that there is at least 1 mVal of said salt-forming carboxyl groups per gram of said structure, and said carboxyl groups being present substantially as free carboxyl groups; said structure containing from 0.05 to 20% of its weight of an impregnant comprising at least one water-soluble nonionic polyalkoxylated surface-active agent having a turbidity point above 20°C.

3,954,643

FOAM-REGULATED WASHING COMPOSITIONS, ESPECIALLY FOR DRUM WASHING MACHINES

Peter Krings, Krefeld; Günter Jakobi, Hilden, and Joachim Galinke, Dusseldorf-Holthausen, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

Filed Aug. 24, 1973, Ser. No. 391,262

Claims priority, application Germany, Sept. 2, 1972, 2243306

Int. Cl.[2] C11D *3/37, 9/26, 10/04;* B01D *19/04*

U.S. Cl. 252—96 5 Claims

1. A foam-regulated washing composition consisting essentially of

a. a surface-active component consisting of from 50 to 100% by weight of said component of an anionic surface-active compound selected from the group consisting of olefin-sulfonates having from 8 to 18 carbon atoms and α-sulfo-fatty acid ester salts having from 10 to 20 carbon atoms in the fatty acid moiety esterified with an alcohol selected from the group consisting of alkanols having from 1 to 4 carbon atoms, alkanediols having from 2 to 4 carbon atoms and alkanetriols having from 3 to 4 car-

bon atoms, and from 0 to 50% by weight of said component of a surface-active compound having good biodegradability and low toxicity selected from the group consisting of anionic surface-active compounds of the sulfonate and sulfate type other than said olefinsulfonates and α-sulfo-fatty acid ester salts, and non-ionic surface-active compounds,

b. soaps of essentially saturated fatty acids having an iodine value of less than 5 and at least 50% of which have from 20 to 24 carbon atoms,

c. a complexing builder salt component consisting of from 75 to 100% by weight of said component of a high molecular-weight polyalkylene-polycarboxylic acid copolymer of a lower alkene having from 2 to 4 carbon atoms with maleic acid, in substantially an equimolar ratio, and from 0 to 25% by weight of said component of complexing builder salts having phosphorus or nitrogen atoms, said components (a), (b), and (c) being present in a weight ratio of 2 to 10:1:7 to 35.

3,954,644

FLEXIBLE CONTACT LENS CLEANING, STORING, AND WETTING COMPOSITIONS

Joseph Z. Krezanoski, and John C. Petricciani, both of Los Altos, Calif., assignors to Flow Pharmaceuticals, Inc., Palo Alto, Calif.

Division of Ser. No. 279,800, Aug. 11, 1972, Pat. No. 3,882,036, which is a continuation-in-part of Ser. No. 148,993, June 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 724,600, April 26, 1968, abandoned. This application July 9, 1973, Ser. No. 377,430

The portion of the term of this patent subsequent to May 6, 1992, has been disclaimed.

Int. Cl.² C11D *3/48*

U.S. Cl. 252—106 **16 Claims**

1. An aqueous solution suitable for cleaning, storing and wetting flexible silicone contact lenses which comprise:

a. 0.01 to 30 percent of a poly(oxyethylene)-poly(oxypropylene) block copolymer having a molecular weight between about 1900 and 15,500, a water solubility in excess of about 10 grams per 100 ml., a cloud point in 1 percent aqueous solution above about 30°C and a Foam Height in excess of 30 mm.;

b. a sufficient amount of germicidal composition compatible with silicone flexible lenses to preserve the sterility of the solution;

c. a sufficient amount of at least one water-soluble, salt compatible with occular tissue to provide a solution salt content equivalent to about 0.5 to 1.8 percent sodium chloride; and

d. balance water.

6. A composition for cleaning flexible polyhydroxylated hydrophilic gel contact lenses which comprises:

a. 0.01 to 40 percent of a poly(oxyethylene)-poly(oxypropylene) block copolymer having a molecular weight between about 1900 and 15,500, a water solubility in excess of about 10 grams per 100 ml., a cloud point in 1 percent aqueous solution above about 30°C and a Foam Height in excess of 30 mm.;

b. a sufficient amount of a germicidal composition compatible with polyhydroxylated hydrophilic gel lenses and containing sorbic acid to preserve the sterility of the composition;

c. a sufficient amount of at least one water-soluble, salt compatible with occular tissue to provide a composition having a tonicity compatible with human tear fluid; and

d. balance water.

3,954,645

ADDITIVE FOR AN ACID CLEANING BATH FOR METAL SURFACES

Joseph V. Otrhalek, Dearborn, and Raymond M. Ajluni, Bloomfield, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 197,948, Nov. 11, 1971, abandoned. This application July 25, 1973, Ser. No. 382,537

Int. Cl.² C09K *13/00*

U.S. Cl. 252—101 **3 Claims**

1. The method of cleaning metal surfaces in an acid bath wherein from about 1 to 4 percent by weight, based on the weight of the bath, of an additive is incorporated into said bath, said additive consisting essentially of:

a. from about 25 to 35 percent by weight of a nitrite ion source;

b. from about 0 to 5 percent by weight of ammonia; and

c. from about 65 to 75 percent by weight of water.

3,954,646

DISINFECTANT COMPOSITION AND METHOD

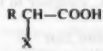
Norman Ellison Dewar, St. Louis, and Said Ibrahim Raziq, Ferguson, both of Mo., assignors to Chemed Corporation, Cincinnati, Ohio

Filed May 7, 1974, Ser. No. 467,686

Int. Cl.² C11D *3/48*

U.S. Cl. 252—106 **6 Claims**

1. A liquid detergent-germicide composition consisting essentially of, in combination, an anti-microbially active alpha-halogenated fatty acid, an anionic surface active agent and a monobasic organic acid selected from the group consisting of acetic acid, hydroxy acetic acid, propionic acid, latic acid and combinations thereof, said anti-microbially active alpha-halogented fatty acid having the formula:



wherein X is a member selected from the group consisting of chlorine, bromine and iodine, and R is an alkyl group of 1 to 16 carbon atoms, and wherein the relative amounts are from 1 part to about 36 parts by weight of alpha-halogenatd fatty acid, from about 2 parts to about 30 parts by weight of anionic detergent and from 1 part to about 20 parts by weight of said monobasic acid.

3,954,647

INDUSTRIAL DRYCLEANING DETERGENT

Clifford A. Neros, Willoughby, Ohio, and Robert A. Ward, Trenton, Mich., assignors to Anscott Chemical Industries, Inc., Fairfield, N.J.

Filed May 23, 1974, Ser. No. 472,592

Int. Cl.² D06L *1/00;* **C11D** *3/28*

U.S. Cl. 252—153 **10 Claims**

1. A drycleaning composition consisting essentially of

a. from about 0.05 to about 1 ounce of a 1-hydroxy-ethyl-2-fatty acid imidazoline per gallon of solvent,

b. from about one-half to about 15 ounces of free water per gallon of solvent, the expression free water is defined as when sufficient water has been added to the drycleaning bath so that an emulsion of water and detergent is formed, and

c. a hydrocarbon or halogenated hydrocarbon drycleaning solvent.

3,954,648

COATINGS REMOVAL COMPOSITION CONTAINING AN ALKALI METAL HYDROXIDE, AN OXYGENATED ORGANIC SOLVENT, AND AN AMINE

Edward John Belcak, King of Prussia, and Leo Francis Corcoran, Audubon, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 887,422, Dec. 22, 1969, abandoned. This application Feb. 5, 1973, Ser. No. 329,503

Int. Cl.² C11D 7/06

U.S. Cl. 252—158 20 Claims

1. The metal coating removal composition comprising an anhydrous liquid mixture of one-fourth to about 10% by weight of alkali metal hydroxide, from 40 to about 60% by weight of at least one oxygenated organic solvent liquid at ambient temperatures and having a boiling point in excess of about 100°C . selected from the group consisting of alcohols, carbonyls, esters, amides, lactones, tetramethyl urea, diphenyl ether and dimethyl sulfoxide and from 40 to about 60% by weight of at least one amine liquid at ambient temperatures and having a boiling point above about 65°C.

11. The process for removing coatings from metal by applying to the coated metal an anhydrous liquid mixture comprising one-fourth to about 10% by weight of alkali metal hydroxide, from 40 to 60% by weight of at least one oxygenated organic solvent liquid at ambient temperatures and having a boiling point in excess of about 100°C. selected from the group consisting of alcohols, carbonyls, esters, amides, lactones, tetramethyl urea, diphenyl ether and dimethyl sulfoxide and from 40 to about 60% by weight of at least one amine liquid at ambient temperatures and having a boiling point above about 65°C., for a time sufficient to loosen the said coatings and thereafter rinsing the metal to remove the loosened coatings.

3,954,649

DETERGENT COMPOSITIONS CONTAINING COATED PARTICULATE CALCIUM SULFATE DIHYDRATE

Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,160

Int. Cl.² C11D 3/04, 3/14, 11/02, 17/06

U.S. Cl. 252—174 12 Claims

1. Particulate calcium sulfate dihydrate having a coating of a substantially water-insoluble calcium salt on and interspersed with the particles thereof, said coating comprising 10% to 75% by weight based on the total combined weight of the water-insoluble calcium salt and calcium sulfate dihydrate of a substance selected from the group consisting of calcium carbonate, calcium silicate, calcium sulfite, calcium orthophosphate, and hydroxyapatite.

10. A process for producing a detergent composition comprising

i. charging into a crutcher about 35% to about 45% water, the percentages being based on total cruthcer charge, by weight,

ii. mixing therewith about 10% to about 60% of sodium carbonate,

iii. adding to said mixture about 1% to about 75% of particulate calcium sulfate dihydrate,

iv. agitating said mixture until a coating of calcium carbonate forms on said particles of calcium sulfate dihydrate, while maintaining the temperature of the mixture between 20°C and about 100°C,

v. adding to said mixture 0% to about 30% sodium sulfate,

vi. adding about 5% to about 30% of a surfactant having detergent properties to form a built detergent slurry in said crutcher, and

vii. spray drying said slurry, said percentages set forth in (ii), (iii), (v) and (vi) being by weight of the spray-dried detergent composition, and the total of the percentages of said coated calcium sulfate dihydrate and sodium sulfate being about 3% to about 75%.

3,954,650

AMINE HARDNER COMPOSITIONS

Joseph Francis Bliss, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 197,102, Nov. 9, 1971, Pat. No. 3,790,522, which is a continuation-in-part of Ser. No. 822,306, May 6, 1969, abandoned. This application Oct. 31, 1973, Ser. No. 411,374

Int. Cl.² C08G 59/56

U.S. Cl. 252—182 7 Claims

1. A polyepoxide-free precursor composition for cured polyepoxide products, to which a filler can be incorporated, said composition being resistant to filler hard-settle upon storage and consisting essentially of at least one polyepoxide amine hardner compound having at least two active amino hydrogen atoms which can be on the same or different nitrogen atom, said amine hardner compound having a molecular weight range from about 45 to 10,000 and being selected from the group consisting of alkyl amines, aromatic amines, aralkyl amines, cycloalkyl amines, alkaryl amines, alkylene polyamines, amino-substituted alcohols and phenols, and polyamides; and at least one quaternary ammonium compound in an amount ranging from about 0.02 to less than 0.1 per cent by weight of said ammonium compound based on the weight of amine hardner present said quaternary ammonium compound being selected from the group consisting of dilauryl dimethyl ammonium chloride and betahydroxyethyl trimethylammonium hydroxide.

3,954,651

SILYATION AGENT FOR GAS CHROMATOGRAPHY

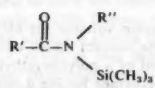
Manfred Donike, Duren, Germany, assignor to Macherey, Nagel & Company, Duren, Germany

Filed Dec. 20, 1973, Ser. No. 425,712

Int. Cl.² B01D 53/30, 15/08; G01N 31/08; C07F 7/30

U.S. Cl. 252—182 11 Claims

1. A silylation agent suitable for use in gas chromatographic investigations, comprises at least one organic silicon-fluorine compound of the general formula



in which R′ is selected from the class consisting of fluoroalkyl, perfluoro-alkyl, fluoro-cyclo-alkyl, perfluoro-cycloalkyl, fluoro-aryl, and perfluoroaryl, and R″ is selected from the class consisting of hydrogen, alkyl, cyclo-alkyl and the partially or wholly fluorinated derivatives of alkyl and cycloalkyl, and the atomic ratio of fluorine to silicon is greater than 4:1.

3,954,652

BLEACHING AGENT

Oswald Schmidt, Frankenthal, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 29, 1973, Ser. No. 392,779

Claims priority, application Germany, Sept. 2, 1972, 2243330

Int. Cl.² C11D 7/54; D06L 3/10

U.S. Cl. 252—188 10 Claims

4. A strongly acidic aqueous bleaching liquor containing, as a reductive bleaching agent, a mixture consisting essentially of

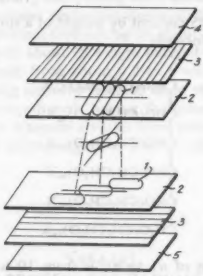
a. 60 to 95% by weight of a sulfur compound in the +4 oxidation state selected from the group consisting of alkali metal bisulfites and pyrosulfite; and

b. 40 to 5% by weight of a zinc compound selected from the group consisting of zinc oxide and soluble zinc salts, the percentages being with reference to the total weight of the dry bleaching agent.

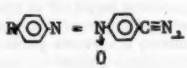
3,954,653
LIQUID CRYSTAL COMPOSITION HAVING HIGH DIELECTRIC ANISOTROPY AND DISPLAY DEVICE INCORPORATING SAME

Yoshio Yamazaki, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

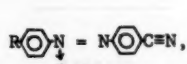
Filed July 3, 1974, Ser. No. 485,674
Claims priority, application Japan, July 6, 1973, 48-75764
Int. Cl.² C09K 3/34; G02F 1/13
U.S. Cl. 252—299 10 Claims



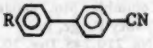
1. An improvement in a liquid crystal display device wherein a liquid crystal cell includes opposed plates having unidirectionally rubbed inner surfaces, at least one transparent electrode on each of said inner surfaces, said electrodes being connectable to an external voltage source, the rubbing directions on said inner surfaces being at right angles to each other, and polarizing filters at the outer surfaces of said plates, the axes of said plates being at right angles to each other, wherein said improvement comprises a liquid crystal composition containing nitriles, wherein said nitriles consist, except for minor quantities of impurities, of at least one compound of the formula A



taken to be equivalent to



and at least one compound of the formula B,



where R is selected from the group consisting of n-C_nH_{2n+1}, n-$C_nH_{2n+1}O$, n-$C_nH_{2n+1}COO$ and n-$C_nH_{2n+1}OCOO$, and n ranges from 1 to 10.

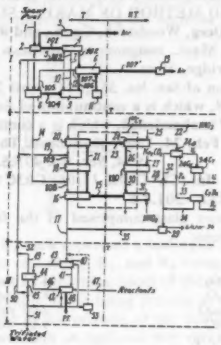
3,954,654
TREATMENT OF IRRADIATED NUCLEAR FUEL

Claude Bernard, Louveciennes, France, assignor to Saint-Gobain Techniques Nouvelles, Courbevoie, France

Filed May 17, 1974, Ser. No. 471,063
Claims priority, application France, May 18, 1973, 73.18073
Int. Cl.² C09K 11/04; C22B 60/04, 60/02; C01B 5/02
U.S. Cl. 252—301.1 W 8 Claims

1. A process for separating the components of spent irradiated nuclear fuel containing uranium, plutonium, tritium and fission products, which process comprises the steps of:

a. shearing said fuel into fragments,
b. dissolving the fragments in aqueous nitric acid to form an aqueous solution including tritium in the form of tritiated water,
c. extracting the aqueous solution by a suitable organic solvent to yield an organic phase containing uranium, plutonium, a major portion of the fission products and tritiated water,
d. washing said organic phase with a dilute aqueous solution of nitric acid to obtain an aqueous phase containing a major part of the tritiated water.
e. submitting said organic phase to a second washing with a volume of dilute aqueous nitric acid free of tritium, said volume being appreciably smaller than that of the organic phase, thus removing substantially all the tritium from the



organic phase while remain therein substantially all the uranium, plutonium and some residual fission products,
f. extracting the tritium-free organic phase, simultaneously or separately, with an aqueous phase to yield an aqueous phase containing the uranium, plutonium and residual fission products,
g. washing the organic phase first with aqueous sodium carbonate, then with alternating alkaline and acid aqueous solutions, thus rendering the organic phase suitable for recycling, and
h. treating the several fractions containing the fission products for the purpose of concentrating at least the most active of such fractions and optionally solidifying them, thus also separating the tritiated water from the aqueous nitric acid, thereby making the nitric acid suitable for recycling.

3,954,655
METHOD OF TAGGING SAND WITH RUTHENIUM-103 AND THE RESULTANT PRODUCT

Forrest N. Case, Oak Ridge, and Clyde E. McFarland, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 27, 1974, Ser. No. 537,019
Int. Cl.² C09K 3/00
U.S. Cl. 252—301.1 R 5 Claims

1. A process for tagging quartz sand particles with a radioisotope of a metal at a temperature at which said sand undergoes a phase transformation comprising the steps of

a. contacting said sand with a solution of a salt of said metal;
b. drying the contacted quartz sand at a temperature below the decomposition temperature of the metal salt;

c. reacting said contacted sand with a solution of an iodide to effect precipitation of said metal as an iodide on the sand;

d. heating said sand to a temperature sufficient to effect both the phase transformation of said sand and the decomposition of said metal iodide to elemental metal and elemental iodine, for providing a radioactive tag; and

e. washing the tagged sand to remove unreacted material and residues, leaving the tagged sand intact.

3,954,656

LASER GLASSES WITH HIGH DAMAGE THRESHOLD AND METHOD OF MAKING SUCH GLASSES

Emil W. Deeg, Woodstock, Conn., and Robert E. Graf, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 353,144, April 20, 1973, Pat. No. 3,830,749, which is a continuation of Ser. No. 148,225, May 28, 1971, abandoned, which is a continuation of Ser. No. 801,800, Feb. 24, 1969, abandoned. This application June 3, 1974, Ser. No. 475,532

Int. Cl.[2] C09K *11/08;* **C03C** *3/04, 3/30*

U.S. Cl. 252—301.4 F **5 Claims**

1. A laser glass comprised of the following metal oxide compositions:

SiO_2	64.04 weight percent
K_2O	18.79 weight percent
Na_2O	2.02 weight percent
BaO	9.09 weight percent
Al_2O_3	1.01 weight percent
B_2O_3	2.02 weight percent
Nd_2O_3	3.03 weight percent.

3,954,657

PROCESS FOR RECLAIMING RARE EARTH OXYSULFIDE PHOSPHOR MATERIAL

Harvey Forest, Skokie, and James Harkin, Schiller Park, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Continuation of Ser. No. 360,277, May 14, 1973, abandoned. This application Nov. 21, 1974, Ser. No. 525,897

Int. Cl.[2] C09K *11/46*

U.S. Cl. 252—301.4 S **6 Claims**

1. In the reclamation of yttrium oxysulfide phosphor material from contaminated cathode ray tube screening waste which contains, in addition to said phosphor material, contaminants including zinc sulfide phosphor materials, the process comprising:

baking the waste to oxidize the said zinc sulfide phosphor materials and thereby quench the luminescence thereof in the waste;

subjecting the waste to a wash in a hot dilute aqueous acid selected from the group consisting of nitric acid, citric acid, acetic acid and hydrochloric acid to remove oxide and oxysulfate coatings on the phosphor material and to remove oxidized zinc compounds present, to thereby improve the adherability of the reclaimed phosphor material during rescreening thereof; and

subjecting the phosphor material to a dilute aqueous wash with sodium tri-polyphosphate to minimize, during rescreening of the reclaimed material, cross-contamination of previously screened phosphor materials.

3,954,658

OIL-IN-WATER EMULSION AND EMULSIFYING OR SOLUBILIZING COMPOSITION THEREFOR

Hisao Tsutsumi; Junichi Kawano; Ikuya Kinoshita; Hirokazu Nakayama, and Toshino Ukena, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1975, Ser. No. 601,971

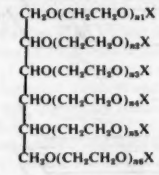
Claims priority, application Japan, Aug. 8, 1974, 49-91086

Int. Cl.[2] B01J *13/00;* **B01F** *17/34*

U.S. Cl. 252—312 **10 Claims**

1. An emulsifying or solubilizing composition, consisting essentially of

I. from 58 to 95 percent by weight of a surface active agent having the formula



wherein the sum of $n1$ to $n6$ is from 10 to 60 and, on the average, up to 3 of the X's are hydrogen and the balance of the X's are linear unsaturated acyl groups having 18 carbon atoms,

II. from 0.5 to 1.0 percent by weight of an alkali metal salt of a linear fatty acid having 12 to 18 carbon atoms,

III. from 2.5 to 6.0 percent by weight of a linear fatty acid having 12 to 18 carbon atoms, and

IV. from 2 to 35 percent by weight of a C_{18} linear unsaturated fatty acid ester of polyethylene glycol having an average molecular weight of 150 to 2000.

7. An oil-in-water emulsion containing as an emulsifier for the oil phase, from 5 to 100 percent by weight, based on the weight of the oil components, of a composition as claimed in claim 1.

3,954,659

METHOD OF FORMING STABLE DISPERSIONS OF ALUMINA

James H. O'Brien, Columbia, Mo., assignor to Philadelphia Quartz Company, Valley Forge, Pa.

Continuation of Ser. No. 210,245, Dec. 20, 1971, abandoned. This application Feb. 5, 1974, Ser. No. 439,799

Int. Cl.[2] B01J *13/00*

U.S. Cl. 252—313 R **3 Claims**

1. A method of forming stable dispersions of substantially colloidal alumina at concentrations above about 25% Al_2O_3 said stable dispersions being stable for at least 2.5 months, in which:

a. an aqueous hydrochloric acid solution is prepared at a pH of from about 1.0 to 3.0;

b. colloidal alumina monohydrate is added to said aqueous solution with vigorous mixing, forming a concentration of about 10 to 30% and a dispersion with a pH of about 1.0 to 3.5;

c. said dispersion is dried at a temperature from about 50°C to 200°C at 0.1 to 1 Atm;

d. the dried dispersion is crushed and redispersed in water to form a dispersion of above about 25% Al_2O_3.

3,954,660

ANIONIC SURFACTANT SLURRY HAVING INCREASED VISCOSITY AND METHOD OF PROVIDING SAID SLURRY

E. Flynt Kennedy, and Dean R. Weimer, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed July 23, 1974, Ser. No. 491,016
Int. Cl.² B01F 17/02, 17/12; C11D 3/20
U.S. Cl. 252—353 12 Claims

1. An anionic surfactant slurry having an increased viscosity, said anionic slurry comprising from about 25 to about 60 weight percent anionic surfactant material; from about 0.5 to about 5 weight percent free oil; up to about 1 weight percent inorganic salt; up to about 75 weight percent water; and, as an essential ingredient, from about 0.2 to 6 weight percent of a viscosity increasing additive selected from the group consisting of alkoxyethoxyethanols having the general formula R''-O-$(CH_2CH_2O)_x$H, wherein x varies from abbut 1 to 2 and R'' is an alkyl group containing from 2 to 6 carbon atoms.

3,954,661

CALCINATION PROCESS FOR RADIOACTIVE WASTES

Douglas C. Kilian, Kennewick, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 10, 1974, Ser. No. 504,789
Int. Cl.² G21F 9/14
U.S. Cl. 252—301.1 W 5 Claims

1. A method for minimizing the volatilization of chlorides during the solidification of liquid intermediate-level radioactive waste by calcining the liquid waste in a fluidized-bed calciner comprising:

blending from 2 to 5 parts zirconium fluoride wastes with 1 part intermediate-level wastes;

adding about one-half mole of calcium nitrate per mole of fluoride present in the liquid solution; and

calcining the mixture whereby a high bulk density calcine product containing chloride is produced, thus tying up the chloride and minimizing volatilization of the chloride.

3,954,662

AQUEOUS FOAM COMPOSITIONS TO SUPPRESS COAL DUST

Ival O. Salyer; James L. Schwendeman, both of Dayton, and Shih-ming Sun, Kettering, all of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Continuation of Ser. No. 226,207, Feb. 14, 1972, abandoned. This application Jan. 2, 1974, Ser. No. 430,342
Int. Cl.² C09K 3/22; E21F 5/02
U.S. Cl. 252—382 13 Claims

1. An aqueous foamable composition usable to suppress coal dust comprising water, a detergent wetting agent to wet the coal and promote foaming, and a sufficient amount to give body to the foam and to bind the coal dust particles to inhibit reaerosolization of an interpolymer soluble in water at 25°C. of:

a. a polymerizable vinyl ester and

b. a partial ester compound interpolymerizable therewith selected from the group consisting of partial esters of ethylenically unsaturated aliphatic dicarboxylic acids and anhydrides containing fron 4–8 carbon atoms and mixtures thereof; said dicarboxylic acid or anhydride having up to half of its acidic hydrogen atoms replaced by lower alkyl groups of 1–8 carbon atoms and mixtures thereof.

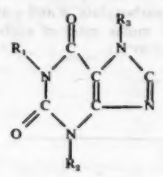
3,954,663

PROCESS FOR THE PREPARATION OF LIMULINA LYSATE

Masaaki Yamamoto, Yokohama; Masayoshi Kobayashi, Kawasaki, and Sashichi Okabe, Tokyo, all of Japan, assignors to Teikoku Horinine Mfg. Co. Ltd., Tokyo, Japan

Filed Dec. 10, 1973, Ser. No. 423,552
Claims priority, application Japan, Dec. 18, 1972, 47-126161; Nov. 19, 1973, 48-129147
Int. Cl.² C09K 3/00; G01N 31/00, 33/16; C12K 1/04; A61K 35/56, 31/52
U.S. Cl. 252—408 19 Claims

1. In a process for the preparation of Limulina lysate comprising extracting the blood of horseshoe crabs (Limulina) into an isotonic buffer solution containing an agent which inhibits the agglutination of amebocyte, separating the amebocyte from said solution, breaking the amebocyte, and recovering Limulina lysate, the improvement comprising: (A) the addition of methyl derivatives of xanthine, or the acid addition or alkali salts thereof, having the formula



in which R_1, R_2, and R_3 each represent a hydrogen atom or a methyl group, at least one of R_1, R_2, and R_3 being a methyl group, as the agglutination-inhibiting agent of the amebocyte, the agglutination-inhibiting agent being present at a concentration of 0.5 to 2 mM in the mixture of the isotonic buffer solution and the blood; with an optional step of (B) further extracting the amebocyte content with 20 to 50 ml, per the amount of amebocyte obtained from 100 ml of the initially extracted blood, of an extraction solvent having a pH of 6.0 to 8.0 and containing at least one alkaline earth metal ion and, optionally, an alkali metal ion, with the provisos that the alkaline earth metal ions are present at a concentration of from 2 to 60 mM and the alkali metal ions are present at a concentration of from 10 to 150 mM, and a further optional step of (C) freeze-drying the so-obtained Limulina lysate containing extraction solution.

3,954,664

ADDITION POLYMERIZATION PROCESS

Donald R. Napier, Corpus Christi, Tex., and Paul H. Washecheck, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 2,437, Jan. 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 698,430, Jan. 17, 1968, abandoned. This application Jan. 10, 1972, Ser. No. 216,770
Int. Cl.² B01J 27/26
U.S. Cl. 252—429 R 10 Claims

1. A free radical catalyst system consisting essentially of a copper salt which yields the cupric ion in aqueous solution, a copper (II) chelating agent and a water soluble cyanide selected from the group consisting of an alkali metal cyanide, alkaline earth metal cyanide, ammonium cyanide and tetramethyl ammonium cyanide.

3,954,665

CATALYST FOR THE DIMERIZATION OF DIOLEFINS USING THE REDUCTIVE PROPERTIES OF METAL CARBONYLS

Igor Tkatchenko, Pau, France, assignor to Societe Nationale des Petroles d'Aquitaine and Institut Francais du Petroles des Carburants et Lubrifiants, both of, France

Filed Apr. 11, 1974, Ser. No. 459,965

Claims priority, application France, Apr. 12, 1973, 73.13293

Int. Cl.² B01J 31/20, 27/24, 27/26

U.S. Cl. 252—429 R 13 Claims

1. A catalyst for the dimerization of diolefins which is the reaction product produced by mixing a transition metal carbonyl of the formula $M^1m(CO)_n$ in which M^1 is a transition metal of Groups VIB, VIIB or VIII, m is an integer of 1–4, and n is an integer of 1–15, and a halide or pseudo halide of a transition metal of the formula $(M^2L_pX_q)_r$ in which M^2 is a transition metal of Groups VIB, VIIB or VIII, L is nitrosyl or trihaptoallyl, X is selected from the group consisting of halogen, cyanide, sulfocyanide, isocyanate, nitrate, nitrite, sulfate, acetylacetonate and carboxylate, p and q are 1–3, and r is an integer, wherein the molar ratio of carbonyl to halide or pseudo halide is 0.2:1 to 3:1.

3,954,666

SEMIPERMEABLE MICROCAPSULES CONTAINING HETEROGENEOUS CATALYSTS AND FERROMAGNETIC MATERIALS

Mark James Marquisee, Wilmington, and William W. Prichard, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 11, 1974, Ser. No. 487,815

Int. Cl.² B01J 23/42, 23/44, 23/74, 31/08

U.S. Cl. 252—430 9 Claims

1. A semipermeable microcapsule which comprises an outer semipermeable polymeric skin encapsulating (1) a finely divided solid heterogeneous catalyst selected from the group consisting of nickel, palladium, platinum, ruthenium, rhodium, platinum oxide, cobalt oxide and ion exchange resins and (2) a ferromagnetic material dispersed in a medium selected from the group consisting of water and organic solvents, said polymeric skin being permeable to said medium.

3,954,667

COMBUSTION CATALYST FOR PROPELLANTS

Joseph S. Stack, Riverdale, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 56,018, July 1, 1970. This application Dec. 14, 1973, Ser. No. 423,366

Int. Cl.² B01J 31/12

U.S. Cl. 252—431 N 7 Claims

1. A combustion catalyst for nitrocellulose base propellants for reducing the burning rate dependency of the propellant to variations of pressure and temperature, which comprises a product obtained by reacting lead stannate hydrate and 2,4-tolylene diisocyanate to produce a reaction product and thereafter sintering said reaction product.

3,954,668

NICKEL CONTAINING OLEFIN OLIGOMERIZATION CATALYST

Jin Sun Yoo, South Holland, and Ronald L. Milam, Hazel Crest, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation of Ser. No. 257,970, May 30, 1972, abandoned, which is a division of Ser. No. 852,911, Aug. 25, 1969, Pat. No. 3,697,617. This application Oct. 7, 1974, Ser. No. 512,785

Int. Cl.² B01J 31/12

U.S. Cl. 252—431 P 15 Claims

1. A catalyst comprising a complex consisting essentially of

A. a nickel compound selected from the group consisting of nickel halide, a nickel hydrocarbyl ditertiary phosphine complex, dialkoxy nickel, dialkoxy nickel carboxylate, a nickel salt of a carboxylic acid, a nickel chelate of a beta-diketone, and a nickel chelate of a beta-ketocarboxylic acid ester, and

B. a chloro-containing electron donor ligand of a phosphorus compound having the general formula:

$$(Ar)_{3-n} - P - (Cl)_n$$

wherein Ar is a monovalent aryl radical of six to about 12 carbon atoms and n equals 1 or 2, with

C. a non-protonic Lewis acid reducing agent capable of reducing nickel acetylacetonate to an oxidation state of less than 2 and capable of forming a coordination bond with nickel, represented by the formula:

$$R_{(n'-Y)}MX_Y$$

wherein R is hydrocarbyl, M is a metallic element of coordination number n' whose halides are Lewis acids, X is halogen having an atomic number of 9 to 53, and Y is a number having a value of from 1 to n'−1 on a solid, acidic silica-based support, the molar ratio of B to A being about 3 to 10:1 and the molar ratio of C to A being about 3 to 40:1, said components C and A being combined to reduce nickel represented by A to an oxidation state of less than 2 and components A, B and C are present in a mole ratio which provides a colloidal precipitate fixed on the solid acidic silica-based support and which when combined produce an effective oligomerization catalyst.

3,954,669

PROCESS FOR MAKING AN ETHYNYLATION CATALYST

Franz Josef Broecker; Wolfgang Reiss, both of Ludwigshafen; Karl Baer, Weinheim; Siegfried Winderl, Heidelberg-Wieblingen; Wolfgang Schroeder, Bad Durkheim, and Herwig Hoffmann, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 19, 1974, Ser. No. 525,317

Claims priority, application Germany, Nov. 20, 1973, 2357751

Int. Cl.² B01J 31/12, 31/14

U.S. Cl. 252—431 R 6 Claims

1. A process for the manufacture of a catalyst for the production of butynediol from aqueous formaldehyde and acetylene, which comprises

a. heating a compound having the crystal structure of the natural mineral manasseite and the empirical formula

$$Cu_mMg_{6-m}Me(III)_2(OH)_{16}CO_3$$

wherein m is a non-zero positive number having a value of up to 4.5 and Me(III) is trivalent Al, Fe or Cr, to a temperature of from 100° to 350°C, and

b. thereafter reacting the material with aqueous formaldehyde and acetylene.

3,954,670
BORIA-ALUMINA CATALYST BASE

Lloyd A. Pine, Greenwell Springs, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Mar. 27, 1974, Ser. No. 455,236
Int. Cl.² B01J *21/02, 29/06, 23/08*
U.S. Cl. 252—432 **7 Claims**

1. A catalyst composition comprising:
a. a metal or compound of a metal selected from the group consisting of rare earth, Group IB, IIA, IIB, IIIB, IVA, IVB, VB, VIB, VIIB and VIII of the Periodic Table and combinations thereof, and
b. a boria-alumina composition prepared by hydrolysis of a mixture of aluminum alkoxide and boron alkoxide in the presence of water.

7. A catalyst composition comprising:
a. a metal or compound of a metal selected from the group consisting of nickel, cobalt, molybdenum, tungsten and combinations thereof;
b. a crystalline aluminosilicate zeolite prepared by exchange of the sodium form thereof with a cation selected from the group consisting of hydrogen, nickel, cobalt, iron, rare earths and combinations thereof; and
c. a boria-alumina composition prepared by hydrolysis of a mixture of boron alkoxide and aluminum alkoxide in the presence of water at a temperature in the range of 20° to 100°C.

3,954,671
HYDROTREATING CATALYST

Robert J. White, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 27,068, April 9, 1970, abandoned. This application Mar. 2, 1973, Ser. No. 337,518
Int. Cl.² B01J *29/06;* **C10G** *13/02*
U.S. Cl. 252—455 Z **6 Claims**

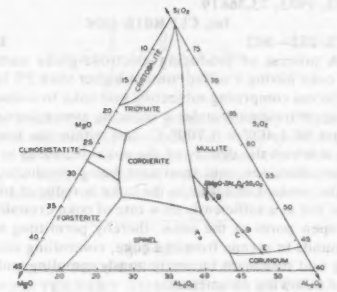
1. A catalyst composite comprising:
A. A gel matrix comprising based on the entire content of said gel matrix:
a. less than 15 weight percent silica,
b. alumina, in an amount providing an alumina-to-silica weight ratio of 50/50 to 100/0,
c. nickel or cobalt, or the combination thereof, in the form of metal, oxide, sulfide or any combination thereof, in an amount of 1 to 10 weight percent of said matrix, calculated as metal,
d. molybdenum or tungsten, or the combination thereof, in the form of metal oxide, sulfide or any combination thereof, in an amount of 5 to 30 weight percent of said matrix, calculated as metal;
B. A crystalline zeolitic molecular sieve containing less than 5 weight percent sodium and containing ions selected from Mn, rare earths of atomic numbers 58–71, and alkaline earths Mg, Ca, Sr and Ba, said sieve further being in the form of particles said particles being dispersed through said gel matrix;
said catalyst having an average pore diameter below 100 Angstroms and a surface area above 200 square meters per gram.

3,954,672
CORDIERITE REFRACTORY COMPOSITIONS AND METHOD OF FORMING SAME

Arthur V. Somers, Flushing; Morris Berg, Grand Blanc, and Archie A. Shukle, Davison, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 4, 1974, Ser. No. 520,549
Int. Cl.² B01J *29/06;* **C04B** *35/04*
U.S. Cl. 252—455 R **10 Claims**

7. A method of making a refractory ceramic catalyst support having a plurality of parallel fluid passages extending therethrough which comprises forming a mixture, in % by weight, of from about 32.6 to 39.0% talc, from about 24.7 to 29.7% clay, from about 13.1 to 19.5% calcined kyanite, and from about 11.8 to 26.5% alumina, the mixture being such that after firing the composition is substantially on the straight line defined by compositions on the triaxial diagram of the magnesia-alumina-silica system consisting essentially of about the following percent by weight of the indicated constituents:
point B — 35.2% Al_2O_3, 51.2% SiO_2, 13.6% MgO
point C and D — 42.2% Al_2O_3, 45.7% SiO_2, 12.1% MgO
point E — 46.7% Al_2O_3, 42.1% SiO_2, 11.2% MgO,
the major crystalline phase being cordierite and the minor crystalline phase being mullite, and the amount of Na_2O and K_2O contained in the body being less than about 0.14% by weight, dry mixing the powder constituents for a period sufficient to obtain a uniform blending, adding a uniform solution of an organic binder material in water from which the salts have been removed and wet mixing the materials for an additional period to achieve uniform wetting, the amount of the water being such as to achieve a batch consistency which enables extrusion while enabling the extruded body to stand without sag in the green state, feeding the materials through an extruder to form the desired catalyst support green body, drying said body to remove substantially all the water therein, firing the dry body at a peak temperature of from about 2550° to 2570° F. for a period of from 3 to 4 hours and finishing the fired body to the desired size by removal of the end portions to eliminate any collapsed fluid passage portions.



3,954,673
PROCESS FOR PREPARING CATALYSTS FOR HYDRODESULFURIZATION

Tatsuo Morimoto, Yokohama, Japan, assignor to Chiyoda Kako Kensetsu Kabushiki Kaisha, Yokohama, Japan

Filed Feb. 1, 1972, Ser. No. 222,640
Claims priority, application Japan, Feb. 1, 1971, 46-3946
Int. Cl.² B01J *21/04, 23/88*
U.S. Cl. 252—465 **6 Claims**

1. A process for preparing a hydrodesulfurization catalyst which has fine pores sharply distributed in the range og 50 to 200 A which comprises
i. adding a molybdate to a water-soluble aluminum complex represented by the formula $Al_n(OH)_m X_{3n-m}$ wherein $n>1$, $3n>m$ and X is an anion selected from the group consisting of Cl, NO_3, I, Br and ClO_4 whereby there is obtained a uniform solution composition;
ii. treating the resulting composition hydrothermally at a temperature on the order of from about 120° to about 330° C;
iii. adding thereto a water soluble salt of molybdenum or tungsten and at least one member selected from the group consisting of water soluble salts of iron, cobalt or nickel;
iv. further adding thereto and mixing at least one member selected from the group consisting of diethylene glycol, carboxymethyl-cellulose, glycerin, polyethylene glycol, microcrystalline cellulose, hexamethylene tetramine,

azodicarbonamide and dinitrosopentamethylene tetramine; and

v. treating the resultant mixture by drying and calcinating whereby said catalyst is obtained.

3,954,674

PROCESS AND DEVICE FOR CALCINATING DESULFURIZATION OF GREEN COKES WITH HIGH SULFUR CONTENT BY THE PREPARATION OF HIGH QUALITY AND DENSITY DESULFURIZED COKES

Thomas Reis, 4 Villa de Madrid, 92 Neuilly, France

Filed Dec. 26, 1973, Ser. No. 427,437

Claims priority, application France, Jan. 26, 1973, 73.02723; Oct. 12, 1973, 73.36620; Jan. 26, 1973, 73.02724; Oct. 12, 1973, 73.36619

Int. Cl.² H01B *1/04*

U.S. Cl. 252—502 **15 Claims**

1. A process of producing electrode-grade carbon from green coke having a sulfur content higher than 3% by weight, said process comprising subjecting said coke to a desulfurizing calcination treatment under a reducing atmosphere at a temperature of 1,400° – 1,700° C. and within the temperature range at which the density of the coke decreases as the temperature increases, said treatment being conducted at least until the content of sulfur in the coke is reduced to 1.2% by weight, but at a sufficiently slow rate of coke crystallization to form open pores in the coke, thereby permitting sulfurized compounds to escape from the coke, controlling said process during said treatment by continuously sampling and measuring the following parameters:

a. coke sulfur content

b. coke graphitization

c. coke pore structure

d. coke density, and

adjusting operation conditions in response to said parameters to yield the desired properties of the resultant coke.

3,954,675

HEAVY DUTY OXIDIZING BLEACH STABLE LIQUID LAUNDRY DETERGENT

Jack T. Inamorato, Westfield, and Robert W. McDonnell, Teaneck, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 258,604, June 1, 1972, abandoned. This application June 24, 1974, Ser. No. 482,624

Int. Cl.² C11D *9/44*

U.S. Cl. 252—543 **3 Claims**

1. A clear oxidizng bleach stable heavy duty liquid detergent composition substantially devoid of phosphate and nitrogeneous builder having from 30 to 80% by weight of a detergent system consisting essentially of nonionic and anionic detergent in which the weight ratio of nonionic to anionic is 15:1 to 1:1, from 5 to 35% by weight of a lower monohydric, dihydric or trihydric alkanol, from 5 to 35% by weight water and from 0.5 to 5% by weight of a fluorescent brightener system including at least a major amount of 4,4′-Bis(4-phenyl-1,2,3-triazol-2-yl)-2,2′-stilbene disulfonic acid and salts thereof.

3,954,676

SULFONATE DETERGENTS

Melvin E. Tuvell, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sept. 26, 1973, Ser. No. 400,723

Int. Cl.² C11D *1/52, 1/14*

U.S. Cl. 252—548 **2 Claims**

1. An aqueous composition of matter consisting essentially of an aqueous solution of alpha olefin sulfonate having 14 to 16 carbon atoms per molecule and monoethanol amide, said solution containing at least about 8 percent by weight of the alpha olefin sulfonate and having an alpha olefin sulfonate:-monoethanol amide weight ratio in the range of from 2.67:1 to 3.33:1, said monoethanol amide being a mixture of lauric monoethanol amide and myristic monoethanol amide in a weight ratio of about 70:30.

3,954,677

SULFONATED AROMATIC-FORMALDEHYDE CONDENSATION PRODUCTS

Robert E. Law, Houston, Tex., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 18, 1974, Ser. No. 524,784

Int. Cl.² B01F *17/00*

U.S. Cl. 252—355 **5 Claims**

1. A process of preparing a water soluble dispersant which comprises adding urea to an aqueous solution of a water soluble sulfonate of a condensation product of formaldehyde and an aromatic sulfonic acid, and heating the resultant mixture, the quantity of urea being sufficient to enhance the effectiveness of said dispersant as an additive to disperse and reduce viscosity in oil well cementing compositions with less retardation in the setting of such cementing compositions as compared with the same compositions to which no urea has been added, said aromatic sulfonic acid being prepared by sulfonating an aromatic compound from the group consisting of alpha-naphthol, beta-naphthol, naphthalene, toluene, benzene, phenol, methyl, ethyl, isopropyl and butyl naphthalenes and alkylated benzenes containing 1-8 carbon atoms in the alkyl substituent groups, said aqueous solution of water soluble sulfonate being neutralized to a pH of 7 to 9, and heated with said urea for at least 2 hours at 70°C. to 90°C., the quantity of urea being within the range of 1 to 5% by weight of said sulfonate.

3,954,678

SEMIPERMEABLE MICROCAPSULES CONTAINING A SILICA GEL

Mark James Marquisee, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 11, 1974, Ser. No. 487,814

Int. Cl.² B01J *2/08, 37/00*

U.S. Cl. 252—451 **11 Claims**

1. A semipermeable microcapsule which comprises an outer semipermeable polymeric skin selected from the group consisting of polystyrene, collodion, ethylcellulose, cellulose acetate butyrate, polyamide, polyurethane, polysulfonamide, polyurea, polyester and polycarbonate encapsulating therein a silica gel.

5. The semipermeable microcapsule of claim 3 in which the silica gel is formed from a silicate solution.

10. The semipermeable microcapsule of claim 3 which also contains a heterogeneous catalyst and a ferromagnetic material.

3,954,679

VISCOSITY REDUCTION OF AQUEOUS ALPHA-OLEFIN SULFONATE DETERGENT COMPOSITION

Harold Eugene Wixon, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 26, 1973, Ser. No. 419,160

Int. Cl.² C11D *1/14, 3/065, 11/02*

U.S. Cl. 252—555 **23 Claims**

1. An aqueous alpha-olefin sulfonate detergent composition consisting essentially of such alpha-olefin sulfonate detergent, aqueous medium and a viscosity reducing proportion, at least 10%, of a water soluble inorganic halide salt selected from the group consisting of alkali metal, alkaline earth metal and ammonium halides and mixtures thereof.

9. A method of reducing the viscosity of an aqueous alpha-olefin sulfonate detergent composition, which consists essentially of an alpha-olefin sulfonate detergent and an aqueous medium, which comprises admixing with it a viscosity reducing proportion, at least 2%, of a water soluble inorganic halide

salt selected from the group consisting of alkali metal, alkaline earth metal and ammonium halides and mixtures thereof.

3,954,680

STABILIZED ELECTROCONDUCTIVE POLYMERS

Roger H. Jansma, Park Forest, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed May 6, 1974, Ser. No. 467,405
Int. Cl.² C08G 65/26
U.S. Cl. 260—2 BP 8 Claims

1. A polymer of a secondary amine and a monomer containing at least one vicinal expoxide function and at least one alkyl halide function with an overdose of crosslinking agent, and stabilized with a tertiary amine reactive with said alkyl halide function, said cross-linking agent being selected from the group consisting of primary amines, ammonia and mixtures thereof.

3,954,681

METHOD OF RECLAIMING CURED POLYURETHANE ELASTOMERS

Richard M. Castle, West Alexandria, Ohio, assignor to Whittaker Corporation, Los Angeles, Calif.

Continuation of Ser. No. 363,907, May 25, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,132
Int. Cl.² C08J 11/04; C08G 18/82
U.S. Cl. 260—2.3 10 Claims

1. A method of reclaiming cured polyurethane elastomers, which method comprises milling particulate cured polyurethane elastomer under shear sufficient to increase the temperature of the elastomer and for a time sufficient to form said particulate elastomer into a cohesive mass and mixing said cohesive mass at elevated temperature between about 120°F and 280°F but below the degradation temperature thereof and under superatmospheric pressure with a devulcanizing agent selected from the group consisting of water and aliphatic alcohol and mixtures thereof until a uniform, continuous, cohesive, partially devulcanized substantially undegraded, moldable, thermoplastic polyurethane product, capable of being formed into a product having improved heat resistance, abrasion resistance and tensile strength is obtained.

10. A reclaimed, partially devulcanized thermoplastic polyurethane elastomer prepared from cured polyurethane elastomer by milling the same in fine particulate form under shear at elevated temperature to a cohesive mass and mixing said mass at elevated temperature between about 120°F and 280°F but below the degradation temperature thereof, and superatmospheric pressure with a devulcanizing agent selected from the group consisting of water, aliphatic alcohol and mixtures thereof until a partially devulcanized, uniform, cohesive elastomer is provided which is moldable to a product having improved tensile strength, abrasion resistance and heat resistance, in comparison with the starting material.

3,954,682

INSOLUBLE POROUS POLYMERIC-PHENOLIC COMPLEXES

Marvin M. Fein, Westfield, N.J.; Nathan D. Field, Allentown, and Earl P. Williams, Pen Argyl, both of Pa., assignors to GAF Corporation, Wayne, N.J.

Continuation of Ser. No. 25,249, April 2, 1970, abandoned. This application Jan. 25, 1974, Ser. No. 436,608
Int. Cl.² C08J 9/00
U.S. Cl. 260—2.5 B 4 Claims

1. Porous granules or beads comprising a complex compound of a phenolic material containing a phenolic hydroxyl group with a water insoluble but water swellable crosslinked polymer of an N-vinyl lactam or an N-actyl-N-vinyl amide.

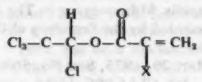
3,954,683

1,2,2,2-TETRACHLORETHYL ACRYLATE AND METHACRYLATE POLYMERS AND COPOLYMERS

Frantisek Hrabak, and Milos Vacek, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 301,275, Oct. 27, 1972, Pat. No. 3,882,169. This application Aug. 12, 1974, Ser. No. 496,659
Claims priority, application Czechoslovakia, Oct. 28, 1971, 7599-71; Oct. 28, 1971, 7600-71
Int. Cl.² C08F 20/24, 120/24, 220/24
U.S. Cl. 260—2.5 FP 10 Claims

1. A polymeric composition comprising approximately by weight (a) 100 to 1% of a monomer derived from the 1,2,2,2,-Tetrachloroethyl ester of the formula



wherein X is selected from the group consisting of hydrogen, chlorine and methyl, said monomer (a) being copolymerized with (b) 0 to 99% of a monomer selected from the group consisting of olefins, diolefins, conjugated diolefins, a monoalkenyl aromatic moiety and a nitrogenous moiety.

3,954,684

FOAM PROCESS USING TERTIARY AMINE/QUATERNARY AMMONIUM SALT CATALYST

William J. Farrissey, Jr., Northford, and Abdul-Munim Nashu, Hamden, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed July 9, 1974, Ser. No. 486,829
Int. Cl.² C08G 18/18; B01J 31/02
U.S. Cl. 260—2.5 AW 18 Claims

8. In a process for the preparation of a cellular polymer in which the major recurring polymer unit is isocyanurate which process comprises bringing together in the presence of a blowing agent, a polyisocyanate, a trimerization catalyst, and a minor amount of a polyol, the improvement which comprises employing as the catalyst, a combination of the following ingredients:

a. from about 0.002 to about 0.0315 equivalent per equivalent of said polyisocyanate of a tertiary amine trimerization catalyst; and

b. from about 0.0055 to about 0.022 equivalent per equivalent of said polyisocyanate of a lower-alkanoic acid quaternary ammonium salt selected from the group consisting of tetramethylammonium acetate, tetraethylammonium acetate, tetramethylammonium propionate, tetramethylammonium octanoate, tetramethylammonium 2-ethylhexanoate, benzyltrimethylammonium 2-ethylhexanoate, and methyltribenzylammonium 2-ethylhexanoate.

3,954,685

SULFUR FOAM PRODUCT AND PROCESS

Gar Lok Woo, Tiburon, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. Nos. 344,694, March 26, 1973, Pat. No. 3,892,686, and Ser. No. 438,508, Jan. 31, 1974, Pat. No. 3,887,504, said Ser. No. 344,694, is a continuation-in-part of Ser. No. 253,144, May 15, 1972, abandoned. This application May 10, 1974, Ser. No. 468,857
The portion of the term of this patent subsequent to June 3, 1992, has been disclaimed.
Int. Cl.² C08J 9/00
U.S. Cl. 260—2.5 A 16 Claims

1. A process for producing a sulfur foam which comprises (a) forming a sulfur system containing an aliphatic polysulfide; (b) contacting and reacting an organic protonic acid with

the sulfur of the aliphatic polysulfide to obtain a sulfur system-acid adduct having unreacted acid groups, said acid being capable of forming CO_2 or COS upon reaction with an isocyanate, and (c) reacting polyisocyanate or polyisothiocyanate with said unreacted acid groups to liberate CO_2 or COS and obtain sulfur foam.

3,954,686

LOW DENSITY FOAM RESIN COMPOSITE OF HIGH STIFFNESS

Paul Lagally, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1975, Ser. No. 560,080

Int. Cl.² C08G *18/14*

U.S. Cl. 260—2.5 AK **4 Claims**

1. A process for producing a syntactic foam comprising: (I) reacting (A) a dihydroxy polydiene having (1) two terminal hydroxy groups and (2) a predominate amount of vinyl groups on alternate carbon atoms of the polydiene backbone with (B) an organic chain extender which is a diisocyanate in the presence of (C) a graft comonomer selected from the group consisting of N-vinyl-2-pyrrolidone, N-vinyl-3-pyrrolidone, N-vinylcarbazole, N-vinylimidazole, N-vinyl-pyridine, coumarone, indene and mixtures thereof, (D) a peroxide free radical initiator, and (E) a tris(alkylperoxy) vinyl silane to produce an elastomeric material having the peroxides,, the tris(alkylproxy) vinyl silane, and the graft comonomer dispersed therethough substantially unreacted, (II) packing microspheres into the elastomeric material wherein the microspheres are selected from the group consisting of hollow glass microspheres, hollow phenolic microspheres and mixtures thereof, and then (III) curing the elastomer at elevated temperatures to produce a firm resinous material containing the microspheres.

3,954,687

STABLE POLYVINYL ESTER DISPERSIONS AND METHODS OF PRODUCING THE SAME

Hubert Wiest, and Wilhelm Lechner, both of Burghausen, Germany, assignors to Wacker Chemie GmbH, Munich, Germany

Filed Oct. 2, 1974, Ser. No. 511,248

Claims priority, application Germany, Oct. 4, 1973, 2349925

Int. Cl.² C08L *3/02*

U.S. Cl. 260—17 A **7 Claims**

1. A stable aqueous dextrin-polyvinyl ester adhesive mix containing from 20% to 80% of a solids content consisting essentially of

a. from 10 to 90 parts by weight of dextrin, and

b. from 10 to 90 parts by weight of polyvinyl esters produced by emulsion polymerization of a monomer charge of vinyl esters of alkanoic acids having from 1 to 18 carbon atoms and up to 40% by weight of said monomer charge, of oil-soluble, mono-olefinically-unsaturated monomers copolymerizable with said vinyl esters utilizing water-soluble free-radical-forming polymerization catalysts in the presence of from 1% to 10% by weight, based on the weight of said monomer charge of carboxymethyl celluloses having a substitution degree of at least 10, and from 20% to 80% by weight of water.

3,954,688

AQUEOUS ELECTROCOATING COMPOSITION OF THE REACTION PRODUCT OF AN EPOXY ESTER RESIN AND A MALEINIZED DRYING OIL BLENDED WITH A CROSS-LINKING AGENT

Isidor Hazan, Clementon, N.J., and Robert N. Iacona, Newtown Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 30, 1974, Ser. No. 493,067

Int. Cl.² C09D *3/52, 3/56, 3/58*

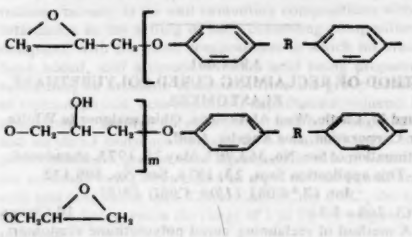
U.S. Cl. 260—21 **10 Claims**

1. An aqueous coating composition having a pH of about 7.2–10.0 comprising 5–50% by weight of film-forming constituents uniformly dispersed in an aqueous medium;

wherein the film-forming constituents consist essentially of

a. 50–97% by weight, based on the weight of the film-forming constituents, of a polymer having an acid number of about 30–60 which is the reaction product of

1. an epoxy ester resin of an epoxy resin of the formula



where R is an alkylene group having 1–4 carbon atoms and *m* is a positive integer sufficiently large to provide a Gardner Holdt viscosity of A to Z_8 measured at 25°C. on a 40% weight solids polymer solution using ethylene glycol monobutyl ether solvent; and drying oil fatty acids selected from the group consisting of linseed oil fatty acids, tung oil fatty acids, dehydrated castor oil fatty acids, soya oil fatty acids and tall oil fatty acids; and

2. a maleinized drying oil which is the reaction product of maleic anhydride and a drying oil selected from the group consisting of linseed oil, tung oil, dehydrated castor oil, soya oil and tall oil; and

b. 3–50% by weight, based on the weight of the film-forming constituents, of a water dispersible cross-linking agent selected from the group consisting of phenol formaldehyde, urea formaldeyde, methylated urea formaldehyde, melamine formaldehyde, alkylated melamine formaldehyde having 1-4 carbon atoms in the alkyl group and benzoguanamine formaldehyde;

wherein the composition contains sufficient basic compound to have said pH and wherein the basic compound is selected from the group consisting of an alkali metal hydroxide, an amine or a polyamine.

3,954,689

SEGMENTED THERMOPLASTIC COPOLYESTER ELASTOMERS

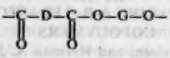
Guenther Kurt Hoeschele, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 10, 1973, Ser. No. 423,019

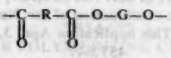
Int. Cl.² C08L *91/00*

U.S. Cl. 260—22 D **9 Claims**

1. A segmented thermoplastic copolyester elastomer which is suitable for injection molding and exhibits high elasticity at break, consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by the formula

I 

and said short chain units being represented by the formula

II 

where D is a divalent radical remaining after the removal of terminal carboxyl groups from dimer acid having a molecular weight of about 565; R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight less than about 300 and G is a divalent radical remaining after removal of hydroxyl groups from a glycol having a molecular weight less than 250; provided,

a. said short chain ester units amount to about 45–75% by weight of said copolyester,

b. at least about 70% of the R groups in formula (II) are 1,4-phenylene radicals and at least about 70% of the G groups in formulae (I) and (II) are 1,4-butylene radicals,

c. the sum of the percentages of R groups which are not 1,4-phenylene radicals and of G groups which are not 1,4-butylene radicals does not exceed about 30, and

d. said copolyester has a melt viscosity of at least 2500 poise at 250°C.

3,954,690

REMOVAL OF SULFURIC ACID COMPOUNDS

Wolfgang Hesse, Wiesbaden; Kurt Hultzsch, Wiesbaden-Biebrich; Albert Jung, Mainz, and Johannes Reese, Wiesbaden-Biebrich, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation-in-part of Ser. No. 776,249, Nov. 15, 1968, abandoned. This application July 19, 1971, Ser. No. 164,129

Claims priority, application Germany, Nov. 17, 1967, 1643829; Mar. 28, 1968, 1768068; Aug. 3, 1968, 1793116

Int. Cl.² C08L *93/00*

U.S. Cl. 260—25 **32 Claims**

1. A process for removing discoloring amounts of color forming sulfur compounds from the reaction products of a reaction mixture containing a terpene reduceable acid-reacting sulfur-containing ingredient as a reagent, reaction product or catalyst, the improvement comprising (1) reacting the reactants in the reaction mixture, (2) then reacting said acid reacting sulfur containing ingredient in the reacted mixture with an amount of an olefinic unsaturated terbene which is sufficient to react with and reduce all of said acid-reacting sulfur containing ingredients and form volatilizable reduction products of all of said sulfur containing ingredients and (3) then heating and maintaining the reacted mixture until no more gaseous products are formed at a temperature between about ambient temperature and about 320° C that is sufficient to substantially reduce, volatilize and remove all of said sulfur containing reduction products to thereby provide an ultimate reaction product that is free of strong discoloring amounts of said color forming sulfur compounds.

3,954,691

GLASS ENAMEL MEDIUM

Norman G. Wolcott, Jr., Mentor, and Jerome D. Thomas, Eastlake, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Jan. 29, 1975, Ser. No. 544,990

Int. Cl.² C08K *5/05, 5/06;* **C08L** *23/06*

U.S. Cl. 260—33.2 R **9 Claims**

1. A medium for decorating materials for glass surfaces, said medium consisting essentially of from about 50 to about 97 weight percent polyether glycols which are solid at room temperature and which have a weight average molecular weight in the range of 2000 to 9000, the remainder of said medium being essentially polyvinyl-type polymers which are solid at room temperature, which are incompatible with said glycols when both are in liquid state and which have a viscosity at 140°C. less than 1000 cps.

3,954,692

ADHESIVE COMPOSITION

Raymond E. Downey, Copley, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 503,228, Sept. 5, 1974, Pat. No. 3,880,953, abandoned, which is a continuation of Ser. No. 430,341, Jan. 2, 1974, which is a continuation of Ser. No. 323,561, Jan. 15, 1973, abandoned, which is a continuation of Ser. No. 169,853, Aug. 6, 1971, abandoned which is a continuation of Ser. No. 807,975, March 17, 1969, abandoned. This application Mar. 3, 1975, Ser. No. 554,357

The portion of the term of this patent subsequent to Apr. 29, 1992, has been disclaimed.

Int. Cl.² C08F *19/08;* **C08K** *5/01;* **C09J** *7/04*

U.S. Cl. 260—33.6 AQ **3 Claims**

1. An adhesive composition which comprises

A. about 100 to about 250 parts by weight of a thermoplastic tackifying resin containing carbon-to-carbon unsaturation therein, comprising from about 20 to about 80 percent units derived from piperylene and correspondingly about 80 to about 20 percent units derived from 2-methyl-2-butene, having a softening point of about 80° to about 110°C, having an iodine number of from about 40 to about 140 according to ASTM D 1959-61, derived from polymerizing with aluminum chloride a mixture comprising piperylene and 2-methyl-2-butene in a mole ratio of about 20:75 to about 75:20, and having a maximum of about 5 weight percent of an aromatic component,

B. about 5 to about 30 weight percent, based on said tackifying resin, of at least one oil primarily selected from petroleum-derived oils, coal tar-derived oils and rosin oils and

C. 100 parts by weight of an unvulcanized elastomeric block copolymer of styrene and isoprene having an intrinsic viscosity of about 0.6 to about 1.5 as determined by 0.5 gram in 50 milliliters of toluene solution at 30°C and having the general configuration A - B - A wherein each A is an independently selected non-elastomeric styrene polymer block having an average molecular weight of about 5,000 to about 30,000 and a glass transition temperature above about 25°C, the total block A content being from about 10 to about 50 percent by weight of the copolymer, and B is an elastomeric 1,4-addition polymer block of isoprene having an average molecular weight from about 50,000 to about 150,000, a tensile strength at 25°C in excess of 200 pounds per square inch, and a glass transition temperature below about 10°C, the difference between the glass transition temperatures of the A and B blocks being at least 40°C.

3,954,693

COATING

Calvin C. Fong, Beverly Hills, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Sept. 24, 1973, Ser. No. 400,222

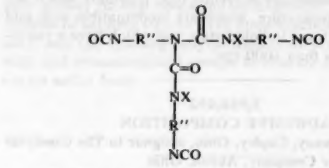
Int. Cl. C08q *22/08*

U.S. Cl. 260—37 N **16 Claims**

1. A substrate coating having improved strippability with non-acid strippers and improved resistance to blistering, comprising the product obtained by mixing together the following components:

an epoxy resin containing functional hydroxy groups;

a hardener comprising a biuret polyisocyanate and an aromatic polyisocyanate, the weight ratio of said biuret polyisocyanate to said aromatic polyisocyanate being about 0.8–4:1, said biuret polyisocyanate having not more than six —NCO groups and having the formula



wherein X is selected from the group consisting of hydrogen and the grouping —CO—NX—R''—NCO and R'' is the organic radical left after removal of the two —NCO groups from an organic diisocyanate selected from the group consisting of cyclohexane diisocyanate, hexamethylene diisocyanate, phenylene diisocyanate, lower alkyl substituted phenylene diisocyanate, lower alkoxy phenylene diisocyanate, diphenylmethane diisocyanate, dicyclohexyl diisocyanate and chloro-substituted phenylene diisocyanate, said hydrogen being the only one on the compound which is reactive with an —NCO group; and

a coupling agent for facilitating bonding with a substrate.

3,954,694

WEARING COMPOSITION

James R. Hallstrom, Brookfield; Raymond J. Hoffman, Fox Point, and Ronald L. Walling, Sussex, all of Wis., assignors to Rexnord, Inc., Milwaukee, Wis.

Filed Feb. 3, 1975, Ser. No. 546,686

The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.² C08G *51/04*

U.S. Cl. 260—37 EP 9 Claims

1. A trowelable wearing composition for on-the-job application to a surface to provide a wearing surface having resistance to wear caused by impact, abrasion, erosion or corrosion, including a matrix composed of an uncured, curable, crosslinkable thermosetting resin, a curing agent for the resin and a thixotropic agent, large abrasion resistant ceramic particles, smaller coabrasion resistant filler particles and of a hardness on the order of that of the material causing the wear dispersed in rather random fashion among the large particles when applied, and a minor amount of a silane coupling agent to bond the matrix and the particles.

3,954,695

MOLDING COMPOSITION WITH RESIN COATED REFRACTORY

Robert L. Cleland, Albion, Mich., assignor to Manley Bros. of Indiana, Inc., Chesterton, Ind.

Filed July 13, 1973, Ser. No. 378,917

Int. Cl.² C08K *9/04*

U.S. Cl. 260—38 7 Claims

1. A green molding composition comprising an admixture of clay, moisture and refractory grains pre-coated prior to admixture with said clay and mositure with a thermoplastic resin having a high graphite yield, said resin comprising between about 0.5 to 5.0% by weight of said composition.

3,954,696

PROCESS OF PREPARING A-B-C ELASTOMERIC BLOCK COPOLYMERS

Bernard C. Roest, Geleen, and Herman A. J. Schepers, Stein, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 350,987, April 13, 1973, abandoned, which is a continuation of Ser. No. 98,406, Dec. 15, 1970, abandoned. This application Apr. 3, 1974, Ser. No. 457,647

Claims priority, application Netherlands, Dec. 19, 1969, 6919054

Int. Cl.² C08L *53/02*

U.S. Cl. 260—880 B 7 Claims

1. In a process for the preparation of block copolymers of the general formula A—B—C including polymerizing at least one monomer to form a living polymer block A, adding a further monomer and continuing polymerization to form polymer block B bound to polymer block A, and continuing polymerization while adding at least one monomer to form terminal polymer block C, thereby producing an A—B—C block copolymer,

wherein each of polymer blocks A and C consists of a non-elastomer homopolymer or copolymer having a glass transition temperature over 25°C. and a number average molecular weight between 200 and 100,000, and polymer block B consists of a conjugated diene having a glass transistion temperature below −10° C. and a number average molecular weight between 25,000 and 1,000,000;

and wherein the contaminants contained in the monomers forming blocks A and C are deactivated,

the improvement comprising introducing the conjugated diene monomer forming polymer block B containing therein contaminants which have not been deactivated and are capable of killing 1–50% of the living polymer block A.

3,954,697

POLY(HIGHER-1-OLEFIN-CO-PROPYLENE) COPOLYMERS AS HOT-MELT, PRESSURE-SENSITIVE ADHESIVES

Richard L. McConnell, Kingsport; Doyle A. Weemes, Greeneville, and Frederick B. Joyner, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,534

Int. Cl.² C08F *210/14*

U.S. Cl. 526—350 12 Claims

1. A hot melt, pressure sensitive adhesive comprising an amorphous propylene/higher 1-olefin copolymer containing 40 to 60 mole percent higher 1-olefin having a melt viscosity range at 190°C. of 10,000 cp. to 75,000 cp., a density of 0.85 to 0.86, a glass transition temperature of −30° to −45°C., and having no melting point measurable by Differential Scanning Calorimetry, wherein said higher 1-olefin is a member of the group consisting of 1-hexene, 1-heptene, 1-octene, 1-nonene and 1-decene.

3,954,698

POLYMERISATION PROCESS

Basil John Bradley, Barry; Peter James Craig, Dinas Powis, and Geoffrey James Gammon, Wenvoe, all of Wales, assignors to BP Chemicals International Limited, London, England

Filed Dec. 20, 1974, Ser. No. 534,790

Claims priority, application United Kingdom, Dec. 26, 1973, 30183/73

Int. Cl.² C08F *2/18, 114/06, 114/16, 114/20*

U.S. Cl. 526—79 7 Claims

1. A batch process for the homopolymerization of a vinyl halide monomer which comprises homopolymerising the monomer in aqueous suspension in the presence of a monomer soluble free radical initiator until the start of the pressure drop and thereafter adding from about 2% to not more than

50% by weight of vinyl halide based on the initial charge over not more than 15 minutes in a period in which the conversion is in the range 70% to 80% of the monomer initially added, completing the polymerisation, and only then recovering the polymer.

3,954,699

PROCESS FOR POLYMERIZING CYCLOOLEFINES

Shoichi Matsumura, Akashi, and Itaru Hatano, Kobe, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 247,421, April 25, 1972, abandoned. This application Aug. 30, 1974, Ser. No. 501,864
Claims priority, application Japan, Apr. 28, 1971, 46-28440
Int. Cl.² C08F *4/24*
U.S. Cl. 526—308 **8 Claims**

1. A process for manufacturing a polymer, comprising the steps of

preparing a heterogeneous catalyst by mixing at a temperature below 80°C tungsten trioxide and Lewis acid in a molar ratio of from 1:3 to 1:30, or by mixing at a temperaure below 80°C tungsten trioxide, Lewis acid (except organo aluminum compound) and organo aluminum compound in a molar ration of from 1:(3–30):(3–30); and

polymerizing cycloolefins having at least one double bond in a ring structure consisting of from 7 to 12 carbons, at a temperature within the range of from −50°C to 80°C, in the presence of said heterogeneous catalyst, wherein said tungsten trioxide and said cycloolefin are in amounts in the molar ratio of from **1:100** to 1:10000.

3,954,700

POLYMERIZATION WITH ORGANO SODIUM CATALYST DISSOLVED IN HEXAMETHYLPHOSPHOROTRIAMIDE

Adel Farhan Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed July 11, 1975, Ser. No. 594,993
Int. Cl.² C08F *4/46*, *4/48*
U.S. Cl. 526—179 **4 Claims**

1. The process of polymerizing a conjugated diene of the class consisting of conjugated dienes containing 4 to 8 carbon atoms, a mixture of such conjugated dienes and a mixture of such conjugated diene and a vinyl monomer, which process comprises polymerizing the monomer or monomers in a solution which contains (a) 0.5 to 5 millimoles of RNa per 100 grams of monomer, in which R is phenyl or an alkyl group of 4 to 8 carbon atoms, and (b) hexaalkylphosphorotriamide in which the alkyl group contains substantially 1 to 4 carbon atoms, the molar ratio of the sodium compound to hexaalkylphorotriamide being substantially 0.001 to 10, using a temperature of 0° to 100° C.

3,954,701

POLYMER COMPOSITION CONTAINING INORGANIC FILLER

Otto G. Schaffling, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 1, 1961, Ser. No. 151,136
Int. Cl.² C08K *5/15*
U.S. Cl. 260—42.28 **6 Claims**

1. A composition for lining the combustion chamber of a rocket motor employing a solid propellant comprised of an epoxy resin, a copolymer of butadiene and acrylic acid, a curing agent, and between about 2.5 and about 30 per cent by weight of an inert inorganic filler selected from the group consisting of carbon, ferric oxide, titanium dioxide and mixtures thereof.

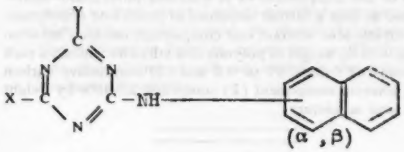
3,954,702

S-TRIAZINE DERIVATIVES CONTAINING NAPHTHYLAMINO GROUPS AS POLYMER STABILIZERS

Hermann Westlinning, Kleinostheim; Werner Schwarze, Frankfurt, and Horst Fleischhauer, Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

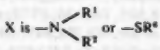
Division of Ser. No. 305,139, Nov. 9, 1972, Pat. No. 3,894,019. This application Nov. 27, 1974, Ser. No. 527,825
Claims priority, application Germany, Nov. 10, 1971, 2155769
Int. Cl.² C08J *3/20*
U.S. Cl. 260—42.32 **27 Claims**

1. A vulcanizable polymer composition comprising natural rubber or a vulcanizable synthetic olefinic elastomer, sulfur or a rubber donator and at least one vulcanization accelerator, which composition includes a 1,3,5-triazine derivative of the formula:

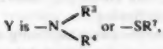


(I)

wherein



or chlorine, and



R^1, R^2, R^3 and R^4 being hydrogen, alkyl of 1 to 18 carbon atoms, phenyl, allyl, or methallyl and wherein alkyl may be substituted by —OH, —OR^5 where R^5 is lower alkyl or —CN and wherein R^1 and R^2 may also be α-naphthyl or β-naphthyl with the provision that the R^2 or R^4 group which is attached to the same N must then be hydrogen; and wherein R^6 and R^7 are alkyl of 1 to 18 carbon atoms or a thioether group of the formula:

$$C_nH_{2n+1}—S—CH_2—CH_2—,$$

n being 1 to 18, said 1,3,5-triazine derivative is present in an amount sufficient to stabilize the elastomer against light, oxidation and heat.

3,954,703

COMPOSITION OF POLY(META-PHENYLENE ISOPHTHALAMIDE) WITH ADDITIVE FOR FABRICATING MOLDED ARTICLE

John William Turnbull, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 262,599, June 14, 1972. This application May 1, 1974, Ser. No. 466,016
Int. Cl.² C08L *77/10*
U.S. Cl. 260—37 N **1 Claim**

1. A composition consisting essentially of a coalescible and densifiable powder of poly(meta-phenylene isophthalamide) having a density of between about 1.0 g./cc. and about 1.30 g./cc. when pressed into a pre-form and a density when sintered of at least about 1.24 g./cc. and between about 1% and

about 15% by weight, based upon the total weight of said composition, of any of the group consisting of metals, metal oxides, graphite and clay.

3,954,704

POLYMER COMPOSITIONS

Stefan Verne, London, and Thomas Geoffrey Heggs, Welwyn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 70,987, Sept. 10, 1970, abandoned. This application July 30, 1974, Ser. No. 493,072

Claims priority, application United Kingdom, Sept. 11, 1969, 45000/69

Int. Cl.[2] C08K *3/04*; C08F *297/08*

U.S. Cl. 260—42.46 7 Claims

1. An admixture of (1) a crystalline polymeric composition comprising at least one sequence of either homopolymerized propylene or of propylene copolymerized with up to 10% by weight of the composition of at least one other olefin monomer, and at least a further sequence of propylene copolymerized with ethylene wherein said composition contains between 10 and 30 % by weight of polymerized ethylene and has a melt flow index of from 0.01 to 0.5 and (2) conductive carbon black, wherein component (2) comprises 20–40% by weight of the total admixture.

3,954,705

GRAFT COPOLYMERS HAVING AN ACID ANHYDRIDE COPOLYMER BACKBONE

Thomas A. Ashe, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 318,505, Dec. 26, 1972, abandoned, which is a continuation of Ser. No. 92,949, Nov. 25, 1970, abandoned. This application June 24, 1974, Ser. No. 482,572

Int. Cl.[2] C08J *3/20*

U.S. Cl. 260—42.57 5 Claims

1. A pigment dispersion consisting essentially of

A. a graft copolymer having

1. a backbone component comprising a copolymer of

a. 0.1%–20%, by weight of the total polymer, of a cyclic carboxylic acid anhydride of 4–7 carbon atoms,

and

b. styrene or substituted styrene;

and

2. at least one graft component comprising a polymer of

a. an ester of acrylic acid or methacrylic acid with an alkanol of 1–24 carbon atoms;

b. a vinyl ester of a carboxylic acid of 3–36 carbon atoms;

or

c. vinyl acetate;

B. a pigment;

and

C. a non-reactive liquid carrier.

3,954,706

POLYCHROMOPHORIC BENZOTRIAZOLE ULTRAVIOLET STABILIZERS FOR ORGANIC COMPOSITIONS

Richard Hsu-Shien Wang, and Gether Irick, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,567

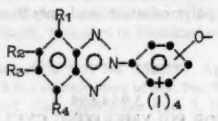
Int. Cl.[2] C08J *3/20*

U.S. Cl. 260—45.8 NT 20 Claims

1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one compound having the formula:

$(A)_a—C$

wherein A is a group having the structure



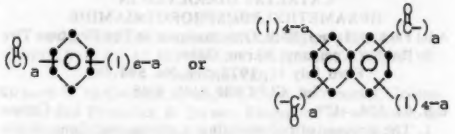
wherein the oxy group is in the meta or para position to the benzotriazole group;

R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, fluoro, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, cyano, carboalkoxy and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the carbonyl group connecting the heterocyclic aromatic A group with the aromatic C group, at least one I substituent on one of the carbon atoms adjacent to said carbon atoms attached to said carbonyl group is hydrogen and said remaining I substituents can all be the same or different;

a is an integer of 1 to 4; and

C is an aromatic group having the formula:



where I is the same substituent as listed above and is present in all positions of the benzenoid ring except the carbon atom attached to the carbonyl group connecting the A and C moieties, and said I substituents can all be one of the substituents listed above or different listed substituents.

3,954,707

POLYMERS STABILIZED BY BIS(ALKYLSULFONYL)VINYLANILINES

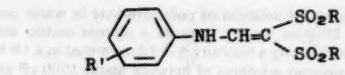
Henry Richmond, Whitehouse Station, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 11, 1975, Ser. No. 603,469

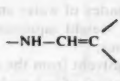
Int. Cl.[2] C08J *3/20*

U.S. Cl. 260—45.9 QA 6 Claims

1. A polymeric composition stabilized against degradation by ultraviolet light by an effective amount of a compound of the formula:



wherein R is alkyl of 1 to 12 carbon atoms or cycloalkyl of 5 or 6 carbon atoms and R' is alkyl, alkoxy, halogen, hydroxy, hydrogen, or



3,954,708

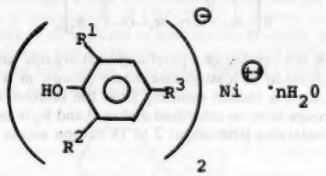
SYNTHETIC POLYMERS STABILIZED WITH A NICKEL BENZOATE AND A POLYOL

Michael Rasberger, Allschwil; Jean Rody, Basel; Paul Moser, Riehen, and Helmut Müeller, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 365,801, May 31, 1973, Pat. No. 3,867,340. This application Dec. 12, 1974, Ser. No. 532,142
Claims priority, application Switzerland, June 21, 1972, 9334/72
Int. Cl.² C08J 3/20
U.S. Cl. 260—45.75 N 12 Claims

1. A composition of matter stabilised against thermal and light degradation and discoloration which comprises a polymonoolefin and a mixture of

A. A nickel benzoate of the formula



wherein R^1 denotes hydrogen or alkyl with 1 to 5 carbon atoms, of the substituents R^2 and R^3, one denotes an alkyl with 3 to 8 carbon atoms and the other denotes —COO^- and n denotes a value of 0 to 2,

B. a polyol of the formula

wherein R^{11} denotes —CH_2OR^{12} and R^{12} denotes alkyl with 1 to 18 carbon atoms or phenyl, such that the amount of components (A) and (B) is in the concentration of 0.01 to 5% by weight of the total composition and the molar ratio of A:B is in the range of 1:0.5 to 1:2,

C. from 0.05 to 0.1% by weight of the total composition of a hindered phenol antioxidant selected from the group consisting of tetrakis β-(3,5-di-tert-butyl-4-hydroxyphenyl)propionic acid pentaerythritol ester and β-(3,5-di-tert-butyl-4-hydroxyphenyl)propionic acid n-octadecyl ester, and

D. from 0 to 0.3% by weight of the total composition of an ester of β-thiodipropionic acid selected from the group consisting of dilauryl β-thiodipropionate and distearyl β-thiodipropionate.

3,954,709

PHENYLETHYL GROUP CONTAINING RESINS FOR THE SYNTHESIS OF PEPTIDES

John M. Stewart, Denver, and Gary R. Matsueda, Aurora, both of Colo., assignors to The Regents of the University of Colorado, Boulder, Colo.

Filed May 29, 1973, Ser. No. 364,908
Int. Cl.² C08F 12/08, 12/36
U.S. Cl. 260—47 UA 20 Claims

1. For use in the solid phase synthesis of peptides, a solid particulate support resin consisting essentially of cross-linked polystyrene-divinylbenzene copolymer having a phenylethyl group in the para position on at least a portion of the phenyl groups of the polystyrene.

8. The method of forming a support resin for the solid phase synthesis of peptides comprising the steps of:

a. reacting a solid cross-linked polystyrene-divinylbenzene polymer with acetyl chloride to form a methyl ketone modified polymer;

b. reacting the methyl ketone modified polymer with formamide to form an ethyl amide modified polymer; and

c. hydrolyzing and neutralizing the phenylethyl amide modified polymer to form an aminoethyl modified polystyrene-divinylbenzene polymer useful in the solid phase synthesis of peptides.

3,954,710

POLYMERS PREPARED FROM IMIDE CONTAINING DIANHYDRIDES

George M. Bower, Pittsburgh, and Richard M. Skena, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 97,334, Dec. 11, 1970, abandoned. This application Nov. 5, 1973, Ser. No. 413,074
Int. Cl.² C08G 73/10
U.S. Cl. 260—47 CP 35 Claims

1. A polymer containing imide linkages corresponding to that prepared by reacting a dianhydride component comprising (A) an aromatic dianhydride monomer containing two imide linkages, two terminal cyclic anhydride groups and two trivalent benzene radicals, the carbonyl groups of a cyclic anhydride and a nitrogen of an imide linkage attached to each of said radicals, the former attached to 1,2-positions of the radical, the latter attached to the 4-position of the radical and (B) an aromatic diamine.

4. A polymer containing imide linkages as claimed in claim 3 wherein said dianhydride containing two cyclic anhydride groups is selected from the group consisting of: 2,3:6,7-naphthalene tetracarboxylic dianhydride, 1,8:4,5-naphthalene tetracarboxylic dianhydride 1,2:5,6-naphthalene tetracarboxylic dianhydride, 3,4:3',4'-diphenyltetracarboxylic dianhydride, 2,3:2',3'-diphenyltetracarboxylic dianhydride, bis(3,4-dicarboxyphenyl) methane dianhydride, 2,2-bis(3,4-dicarboxyphenyl) propane dianhydride, bis(3,4-dicarboxyphenyl) sulfone dianhydride, and bis(3,4-dicarboxyphenyl) ether dianhydride.

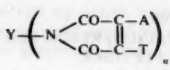
3,954,711

THERMOSETTING POLYMERS FROM A POLYIMIDE AND AMMONIA

Max Gruffaz, La-Mulatiere, and Pierre Ledru, Lyon, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Mar. 4, 1974, Ser. No. 447,522
Claims priority, application France, Mar. 7, 1973, 73.08142
Int. Cl.² C08G 69/02, 69/26
U.S. Cl. 260—47 UA 10 Claims

1. A process for preparing a thermosetting polymer which is soluble in polar organic solvents and has a softening point not exceeding 250°C. which consists essentially of reacting ammonia with a polyimide of the formula:



(I)

in which *a* is a number from 2 to 4, Y represents an organic radical of valency *a*, and A and T, which may be identical or different, each represents hydrogen, chlorine or methyl, the proportions of polyimide and ammonia being such that there are at least 2 imide groups per mol of ammonia.

3,954,712

HOT-CURABLE MIXTURES BASED ON EPOXIDE RESIN

Guiseppe Lottanti, Mutschellen; Ewald Forster, Allschwil; Friedrich Lohse, Oberwil, and Rolf Schmid, Gelterkinden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 397,523, Sept. 17, 1973, abandoned, which is a continuation of Ser. No. 305,778, Nov. 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 289,896, Sept. 18, 1972, abandoned. This application July 26, 1974, Ser. No. 491,961

Claims priority, application Switzerland, Nov. 10, 1971, 16323/71

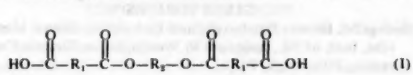
Int. Cl.[2] C08G *30/12*

U.S. Cl. 260—47 EA 6 Claims

1. A hot-curable resin mixture, consisting essentially of

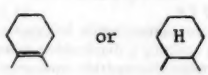
a. a 1,2-polyepoxide;

b. a dicarboxylic acid of the formula I

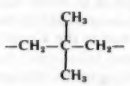


(I)

in which R_1 has the formula



and R_2 is alkylene of the formula $-(CH_2)_{2\ to\ 12}$ or



c. a polycarboxylic acid anhydride selected from the group consisting of methyltetrahydrophthalic anhydride and methylnadic anhydride; and

d. a quaternary ammonium compound or an imidazole catalyst,

and that 0.05 to 0.8 equivalent of said dicarboxylic acid and 0.20 to 0.95 mol of said polycarboxylic acid anhydride are present per 1 equivalent of said polyepoxide.

3,954,713

POLYCARBONATE POWDER

Hilla Schnöring, Wuppertal-Elberfeld; Hugo Vernaleken; Dieter Margotte, both of Krefeld, and Josef Witte, Cologne-Stammheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 294,393, Sept. 28, 1972, abandoned. This application Aug. 22, 1974, Ser. No. 499,710

Claims priority, application Germany, Oct. 2, 1971, 2149308

Int. Cl.[2] C08G *63/62*; C08J *3/14*

U.S. Cl. 260—47 XA 12 Claims

1. A process for the production of polycarbonate powder from a solution of a polycarbonate in a water-immiscible organic solvent comprising the steps of:

a. emulsifying the solution of polycarbonate in water containing 50 ppm to 500 ppm of a styrene-maleic acid copolymer having a viscosity η — (determined in a 1% by weight aqueous solution) of between about 1000 cP and 5000 cP and a decrease in resistance index, *D*, of between about 10 and 45%, said decrease in resistance index, *D*, being defined by the formula:

$$D\,(\%) = \frac{R_W - R_L}{R_W} \times 100$$

where R_W is the resistance index of water and R_L is the resistance index of a 0.05% by weight aqueous solution of the styrene-maleic acid copolymer;

b. separating the organic solvent from the emulsion formed in (a) to obtain a suspension of polycarbonate powder in water, and

c. isolating the polycarbonate powder from the water.

3,954,714

POLYMERIZABLE URETHANE COMPOUNDS AND POLYMERS THEREOF

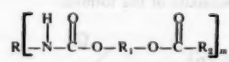
Erich Kuehn, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Division of Ser. No. 211,670, Dec. 23, 1971, Pat. No. 3,856,830. This application Sept. 9, 1974, Ser. No. 504,550

Int. Cl.[2] C08G *18/32*

U.S. Cl. 260—47 CZ 7 Claims

1. A polymer comprising the polymerization product of a polymerizable urethane compound having the structure



wherein R is a residue of a polyfunctional organic isocyanate which contained at least m isocyanate groups, m is at least about 3, R_1 is a radical resulting from the removal of 2 hydroxyl groups from an etherified diphenol and R_2 is an alkenyl radical containing from about 2 to 18 carbon atoms.

3,954,715

COATING COMPOSITIONS CONTAINING DIESTERS OF DIBASIC ACIDS AND GLYCIDYL ESTERS AND AMINOPLAST RESINS

James C. Fang, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

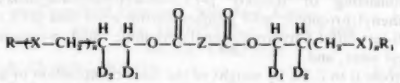
Division of Ser. No. 338,055, March 5, 1973, abandoned. This application Aug. 1, 1974, Ser. No. 493,971

Int. Cl.[2] C08K *5/11*; C08L *61/24*, *61/26*, *61/28*

U.S. Cl. 260—67.6 R 4 Claims

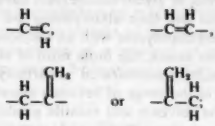
1. A coating composition consisting essentially of

a. approximately 50–80%, by weight of the total, of a compound represented by the structure



where

Z is



D_1 is hydrogen, —OH or $—CH_2OH$; D_2 is hydrogen or —OH, (but one of D_1 or D_2 must be —OH or $—CH_2OH$);
X is

or —O—;
R and R_1 are alkyl radicals of 4–18 carbon atoms;
and
n is 0 or 1;
and
b. approximately 20–50%, by weight of the total, of an aminoplast resin.

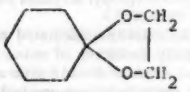
3,954,716

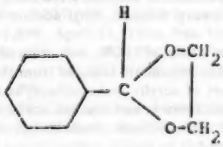
PROCESS FOR THE PREPARATION OF POLYESTERS

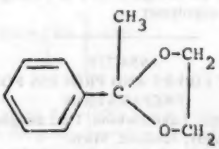
Erwin Muller, and Normann Joop, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

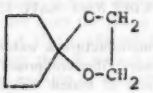
Continuation of Ser. No. 283,677, Aug. 25, 1972, abandoned. This application Nov. 12, 1974, Ser. No. 523,093
Claims priority, application Germany, Sept. 8, 1971, 2144874
Int. Cl.² C08G *63/42*
U.S. Cl. 260—75 R **5 Claims**

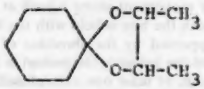
1. A process for the preparation of a polyester with a molecular weight above 10,000 which comprises the step of heating to a temperature of 130°–220°C a mixture consisting essentially of an aliphatic or carbocyclic aromatic polyester having only two free carboxylic acid groups and having an acid number of from about 50 to about 200 and a cyclic ether selected from the group consisting of:

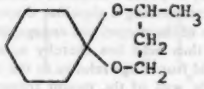


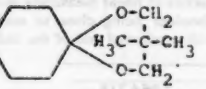


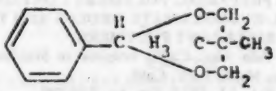


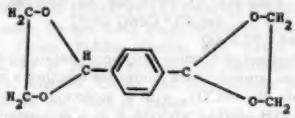


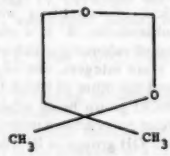










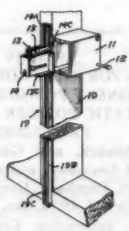


3,954,717

DEVICE FOR USE IN ATTACHING OUTLET BOX TO A STUD

Charles R. Tarr, N. High St., Bridgton, Maine 04009

Filed June 10, 1974, Ser. No. 477,645
Int. Cl.² B25B *11/00*
U.S. Cl. 269—82 **11 Claims**



1. A device for use in placing an object such as an outlet box vertically and horizontally relative to the outer face of a stud in a position for attachment to a side thereof, said device including a U-shaped mount with its closed end flat and positionable against said outer stud face at a selected height, at least one side of the mount including an outwardly disposed marginal portion extending lengthwise thereof and establishing a shoulder that is horizontal and exposed laterally of the stud when thus positioned and against which the box may be held with a side against the side of the stud thereby to establish the height of the box relative thereto, and said mount also including a gauge that is U-shaped in cross section and dimen-

sioned to receive the open end of the mount within it and connected thereto for movement along a path at right angles to the stud against which the box is held with the bottom edge of a side slidably supported by the shoulder of the mount, means operable to lock the gauge to the mount in any selected position along said path, at least one side of said gauge also including an outwardly disposed end portion extending transversely thereof and establishing a shoulder disposed at right angles to the shoulder of the mount and engageable by a front edge portion of the thus held box thereby to establish the desired position of said front edge relative to the outer face of the stud, and the side wall of the mount traversed by said gauge shoulder has a series of linear measuring indicia, and an end of said gauge shoulder being close to said series and vertically alignable with a selected one of the indicia.

3,954,718
PROCESS FOR PREPARING POLYMERS CONTAINING CARBAMOYL-HYDROXAMATE GROUPS AND THE RESULTANT POLYMERS

Ronald Swidler, Palo Alto, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Feb. 13, 1975, Ser. No. 549,786
Int. Cl.² C08G *18/32*
U.S. Cl. 260—77.5 AQ **13 Claims**

1. The method of forming polymers containing carbamoyl-hydroxamate groups which comprises reacting a molecule of the formula $R(-NCO)_x$ with a molecule of the formula $R'(-CO-NH-OH)_y$; wherein R is a monomeric or polymeric organic radical of valence x which contains no —CO—NH—OH substituents, R′ is a monomeric or polymeric organic radical of valence y which contains no —NCO substituents, x and y are integers, one of which has a finite value of at least 1, and the other of which has a finite value of at least 2; each —NCO group being attached to a different carbon in R and at least two carbons intervening between two adjacent —CO—NH—OH groups in R′ when y is greater than 1,

and either

at least one of R and R′ is a polymeric radical

or

both R and R′ are monomeric radicals and each of x and y has a finite value of at least 2;

said reaction being carried out in the absence of functional groups so reactive with isocyanate or hydroxamic acid groups as to be detrimental to formation of carbamoyl-hydroxamate groups at a useful rate, under the conditions required to effect said reaction.

3,954,719
PROCESS FOR THE PRODUCTION OF A SINGLE-COMPONENT POWDER RESIN FOR USE IN ELECTROSTATIC POWDER SPRAY COATING PROCESSES

Dietrich Pirck, Reinbek, and Gündolf Füchs, Steinbeck-Meilsen, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Oct. 2, 1974, Ser. No. 511,411
Claims priority, application Germany, Oct. 13, 1973, 2351477
Int. Cl.² C08F *8/30*
U.S. Cl. 260—77.5 CR **5 Claims**

1. A process for the preparation of a single-component resin powder for use in electrostatic spray coatings applications by the steps of:

a. forming a hydroxyl-containing copolymer by copolymerising a vinylaromatic hydrocarbon of from 8 to 12 carbon atoms with an alpha,beta-unsaturated dicarboxylic acid anhydride in a liquid hydrocarbon solvent medium in the presence of a dispersing agent, the mole ratio of said vinylaromatic hydrocarbon to said dicarboxylic acid anhydride being in the range of about 3 : 1 to 6 : 1, and subsequently half-esterifying the copolymer with aliphatic alcohols or glycol monoethers having from 3 to 12 carbon atoms and then alkoxylating the resultant about half-esterified copolymer with an alkylene oxide of from 2 to 4 carbon atoms, the mole ratio of alkylene oxide to initial alpha,beta-unsaturated dicarboxylic acid anhydride being in the range of between about 1 : 1 and 1 : 2; removing the solvents and volatile products by thin film evaporation at about 200°C and normal pressure to obtain a resin having not more than 1% by weight of volatile matter;

b. reacting said hydroxyl-containing copolymer obtained from (a) at a temperature of about 110°C to about 130°C with a mono-blocked diisocyanate until said single-component resin is formed; and

c. pulverising said single-component resin after cooling to a powdered form having particle sizes ranging between 100 micron and 20 micron.

3,954,720
COPOLYMERISATION PROCESS AND PRODUCT

Joseph Spoor, and Alan Cunningham, both of London, England, assignors to Berger, Jenson & Nicholson Limited, London, England

Continuation-in-part of Ser. Nos. 231,409, March 2, 1972, abandoned, and Ser. No. 231,410, March 2, 1972, abandoned. This application Apr. 5, 1974, Ser. No. 458,454
Claims priority, application United Kingdom, Mar. 15, 1971, 6851/71; Mar. 15, 1971, 6852/71
Int. Cl.² C08F *210/14, 212/08*
U.S. Cl. 526—75 **8 Claims**

4. A random copolymer for coating or filmforming application consisting essentially of units of:

1. 1 to 25% of a 1-olefine heat-reaction product, made by heating one or more normally liquid 1-monoolefines, having from 6 to 22 carbon atoms per molecule, in the presence of from 0.5 to 10% by weight of the heat reaction product of one or more free-radical generating polymerisation initiators, until the product has a non-volatile content, determined at the mid-distillation point of the 1-monoolefines, or at 250° C, whichever is lower, of from 1 to 60 parts by weight of heat-reaction product;
2. 0 to 25% of a monomer selected from the group consisting of acrylamide, methacrylamide and N- alkylol derivatives thereof, and hydroxypropyl acrylates and methacrylates and mixtures thereof;
3. 0 to 8% of an ethylenically unsaturated monomer selected from the group consisting of mono- and di-carboxylic acids, mono-esters of di-carboxylic acids with C_1 to C_{10} aliphatic or cycloaliphatic momohydric alcohols, nitriles of monocarboxylic acids and mixtures thereof;
4. 0 to 60% of a monomer selected from the group consisting of styrene, vinyl toluene, vinyl acetate and mixtures thereof;
5. the balance, to a total of 100%, consisting of one or more copolymerisable monomers selected from the group consisting of esters of acrylic and methacrylic acids and diesters of maleic, fumaric and itaconic acids, with C_1 to C_{10} aliphatic and cycloaliphatic monohydric alcohols, and mixtures thereof:

the percentages of the components 1 to 4 being by weight on the weight of the copolymer.

3,954,721
ABSORBENT FIBERS AND PROCESS FOR THEIR PREPARATION

James Richard Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 9, 1974, Ser. No. 504,609
Int. Cl.² C08F *8/44*; A61L *15/00*
U.S. Cl. 526—14 **3 Claims**

1. As an article of manufacture a water-insoluble, water-swellable flexible polymeric fiber composed of the ammonium salt form of a copolymer of maleic anhydride with a vinyl

aromatic monomer copolymerizable therewith, said copolymer having been cross-linked by reaction with from about 10 to about 40 percent by weight of the copolymer of a cross-linking agent consisting of a mixture of trihydroxy mixed poly(oxyethylene-oxy-1,2-propylene) ethers of glycerol.

3,954,722

MANUFACTURE OF UNIFORM POLYMERS

Adolf Echte, Ludwigshafen; Johann Zizlsperger, Schriesheim; Ernst Tetzlaff, Ludwigshafen, and Rudi Wilhelm Reffert, Beindersheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 26, 1974, Ser. No. 500,517

Claims priority, application Germany, Aug. 31, 1973, 2343871

Int. Cl.[2] C08F *2/02, 2/06*

U.S. Cl. 526—68 **9 Claims**

1. A process for the continuous polymerization of one or more olefinically unsaturated monomers in bulk or in the presence of solvent in a polymerization zone, wherein at least a portion of the low-viscosity materials to be fed to the polymerization zone is thoroughly mixed with a portion of the high-viscosity polymerization liquor contained in the polymerization zone in a mixing zone disposed upstream of the polymerization zone, which mixture is then continuously fed to the polymerization zone, and wherein the viscosity of the polymerization liquor is at least 100 poise and the viscosity of the materials to be fed thereto is less than 10 poise.

3,954,723

NOVEL POLYTHIOETHER DIOLS AND THEIR PREPARATION

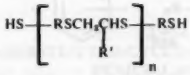
Alexis A. Oswald, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 326,108, Jan. 23, 1973, abandoned, which is a division of Ser. No. 47,109, June 17, 1970, Pat. No. 3,717,618, which is a continuation-in-part of Ser. No. 541,696, April 11, 1966, Pat. No. 3,592,798. This application Oct. 18, 1974, Ser. No. 516,088

Int. Cl.[2] C08F *28/04*

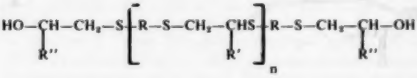
U.S. Cl. 260—79 **9 Claims**

1. A process for the selective preparation of polythioether diols comprising selectively reacting between 10° and 100°C. one mole of polythioether dithiol of the formula



wherein n is about 2 to 1000, R is a divalent organic radical selected from the group consisting of C_2 to C_{18} alkylene, C_4 to C_{12} internally unsaturated alkene, C_6 to C_{30} aromatic and C_2 to C_{30} divalent organic radicals containing sulfur, oxygen or silicon, R' is selected from the group consisting of H, C_1-C_{30} alkyl, C_2-C_{30} alkenyl, C_2-C_{30} alkynyl, C_7-C_{30} aralkyl and mixtures thereof, except that R cannot equal $-CH_2CH(R')-$, with 2 moles of an epoxide of the formula

wherein R'' is hydrogen or methyl to obtain said polythioether diol of the formula



3,954,724

PROCESS FOR PREPARING AQUEOUS DISPERSIONS OF HIGH POLYMER USING PULLULAN AS A DISPERSANT

Seizo Nakashio, Hyogo; Kozo Tsuji; Nobuhiro Toyota, both of Ibaragi; Fumio Fukita, Osaka, and Takeo Oyamada, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Inc., both of, Japan

Filed Mar. 17, 1975, Ser. No. 559,379

Claims priority, application Japan, Mar. 29, 1974, 49-36432

Int. Cl.[2] C08F *36/00;* **C08L** *5/00*

U.S. Cl. 526—200 **11 Claims**

1. A process for preparing an aqueous dispersion of high polymer which comprises

subjecting a polymerizable monomer to emulsion polymerization in water in the presence of a catalyst, characterized by using pullulan in a proportion of 0.5 to 5 parts by weight per 100 parts by weight of a polymerizable monomer, the polymerizable monomer being at least one member selected from the group consisting of compounds represented by the general formula,

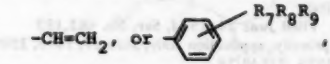
wherein

R_1 is H, a C_1–C_4 hydrocarbon group or a halogen; and

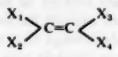
R_2 is H, a C_1–C_4 hydrocarbon group, a halogen, $-OCOR_3$, where R_3 is a C_1–C_{18} hydrocarbon group,

where R_4 is H, an alkali metal, an alkaline earth metal, a C_1–C_{12} hydrocarbon group, or its halogen-, hydroxyl group-, alkoxy group- or epoxy group-substituted derivative,

$-CN$, $-CONR_4R_6$, where R_5 and R_6 are individually H, a C_1–C_{12} hydrocarbon group, or its halogen-, hyroxyl group-, alkoxy group- or epoxy group-substituted derivative,



where R_7, R_8 and R_9 are individually H, a C_1–C_4 hydrocarbon group, a halogen, a hydroxyl group or an alkoxy group; compounds represented by the general formula,



wherein

X_1, X_2, X_3 and X_4 are individually H, a halogen or

where R_{10} is a C_1–C_4 hydrocarbon group, an alkali metal or an alkaline earth metal, provided that X_2 and X_4 should always be substituents other than H;

and maleic anhydride and anhydrous maleimide.

3,954,725

ALCOHOL SOLUBLE ACYLATED PROTEIN HYDROLYZATE REACTION PRODUCTS

Vernon L. Johnsen, and Thomas M. Weisinger, both of La Grange, Ill., assignors to Wilson Pharmaceutical & Chemical Corporation, Chicago, Ill.

Continuation of Ser. No. 234,410, March 13, 1972, abandoned. This application May 17, 1974, Ser. No. 470,740

Int. Cl.² C07G *7/00*; C09H *7/00*

U.S. Cl. 260—112 R **3 Claims**

1. An amide form of polypeptide derivative having utility as an agent substantially completely soluble in anhydrous ethyl alcohol and insoluble in water comprising a reaction product of a hydrolyzate of proteins selected from the group consisting of alkali metal hydrolyzate and calcium hydroxide hydrolyzate having chemically bonded thereto through amide linkages to free $-NH_2$ groups on said hydrolyzate derived from a fatty acid reactant, an acyl radial selected from the group consisting of those having 12, 14, 16 and 18 carbon atoms, substantially all of said acyl radical being so bonded, said reaction product having an average total molecular weight of approximately 433 to 583 when prepared from an alkali metal hydrolyzate and having a 12 carbon atom acyl radical, having an average total molecular weight in the range of 386 to 486 when prepared from an alkali metal hydrolyzate and having a 14 carbon atom acyl radical, having an average total molecular weight in the range of 389 to 489 when prepared from an alkali metal hydrolyzate and having a 16 carbon atom acyl radical, having an average total molecular weight in the range of 392 to 467 when prepared from an alkali metal hydrolyzate and having an 18 carbon atom acyl radical and having an average total molecular weight in the range of 633 to 743 when prepared from a calcium hydroxide hydrolyzate and having a 12 carbon atom acyl radical, having an average total molecular weight in the range of 560 to 686 when prepared from a calcium hydroxide hydrolyzate and having a 14 carbon atom acyl radical, having an average total molecular weight in the range of 464 to 564 when prepared from a calcium hydroxide hydrolyzate and having a 16 carbon atom acyl radical and having an average total molecular weight in the range of 417 to 517 when prepared from a calcium hydroxide hydrolyzate and having an 18 carbon atom acyl radical.

3,954,726

DOUBLE SALTS OF S-ADENOSIL-L-METHIONINE

Alberto Fiecchi, Milan, Italy, assignor to Bioresearch Limited, Milan, Italy

Filed June 24, 1974, Ser. No. 482,153

Claims priority, application Italy, June 27, 1973, 25895/73; May 24, 1974, 23148/74

int. Cl.² C07H *19/16*

U.S. Cl. 260—211.5 R **13 Claims**

1. Double salts of S-adenosil-L-methionine (SAM) with sulphuric acid and p-toluenesulphonic acid.

3,954,727

METHOD OF PRODUCING MICROCRYSTALLINE CELLULOSE

Toshko Sokolov Toshkov; Nikola Russev Gospodinov, and Evstati Penchev Vidimski, all of Sofia, Bulgaria, assignors to DSO "Pharmachim", Sofia, Bulgaria

Filed Aug. 2, 1974, Ser. No. 494,315

Claims priority, application Bulgaria, Aug. 2, 1973, 24254

Int. Cl.² C08B *1/00*

U.S. Cl. 260—212 **4 Claims**

1. A method of producing microcrystalline cellulose from a cellulose containing at least 92% alpha-cellulose and 5 – 6.5% beta cellulose, having a solubility in 5%-sodium hydroxide of 2 to 4% and a viscosity of 110 to 180 mP, comprising hydrolyzing with dilute acid said cellulose at a hydrolysis criterium 0.003 to 0.300, and simultaneously de-aggregating the resulting crystalline mass.

3,954,728

PREPARATION OF TRIAZOLO BENZODIAZEPINES AND NOVEL COMPOUNDS

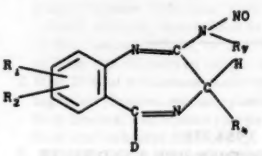
Leo Henryk Sternbach, Upper Montclair, and Armin Walser, West Caldwell, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

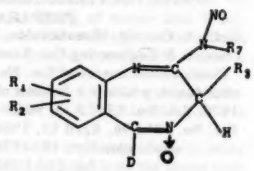
Division of Ser. No. 271,434, July 13, 1972, Pat. No. 3,879,406. This application Jan. 13, 1975, Ser. No. 540,756

Int. Cl.² C07D *213/00*, *243/20*

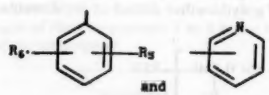
U.S. Cl. 260—239 BD **6 Claims**

1. A compound selected from the group consisting of





wherein D is selected from the group consisting of



and

R_1 and R_2 are each selected from the group consisting of hydrogen, halogen, nitro and trifluoromethyl; R_3 is selected from the group consisting of hydrogen and lower alkyl; R_4 is selected from the group consisting of hydrogen and lower alkyl;

R_5 and R_6 are selected from the group consisting of hydrogen, trifluoromethyl and halogen;

and R_7 is lower alkyl.

3,954,729

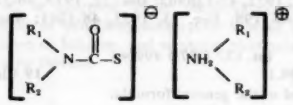
PROCESS FOR PREPARING A THIOLCARBAMATE

Zenichi Sato, Shimizu; Keiichiro Takagi, and Masamichi Shimizu, both of Shizuoka, all of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1974, Ser. No. 454,619
Int. Cl.[2] C07C *155/02*
U.S. Cl. 260—239 B 8 Claims

1. In a process for preparing a thiolcarbamate by reacting a secondary amine having the formula

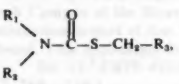
wherein R_1 and R_2 are the same or different and each represent hydrogen, lower alkyl, alkoxy, alkenyl, alkoxyalkyl, cycloalkyl, hydroxyalkyl, benzyl or phenyl, or R_1 R_2 combined is a nitrogen containing heterocyclic ring with carbonylsulfide to form an intermediate of an amine salt of a thiolcarbamic acid having the formula:



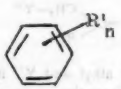
wherein R_1 and R_2 are defined as above, and then reacting the intermediate with an alkyl halide having the formula

$$X - CH_2 - R_3$$

wherein X represents halogen, and R_3 represents hydrogen, lower alkyl, or naphthyl or phenyl which can be substituted with halogen, alkyl, alkoxy, alkylthio, cyano or nitro to yield a thiolcarbamate having the formula



the improvement which comprises reacting said amine in a solution of an organic solvent having the formula



wherein n is 0, 1 or 2 and R′ represents hydrogen, halogen or lower alkyl, which solvent is sparingly soluble or insoluble in water and which dissolves the amine salt of the thiolcarbamic acid, wherein less than 0.48 mole of carbonyl-sulfide per mole of the amine is added to the reaction.

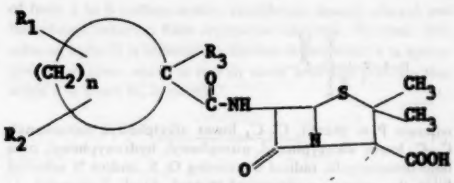
3,954,730

6-(SUBSTITUTED-CYCLOALKYLCARBOXAMIDE) PENICILLANIC ACIDS

Karl Georg Metzger, and Gunther Schmidt, both of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Oct. 21, 1974, Ser. No. 516,359
Claims priority, application Germany, Oct. 25, 1973, 2353584
Int. Cl.[2] C07D *499/74*
U.S. Cl. 260—239.1 16 Claims

1. A compound of the formula



or a pharmaceutically-acceptable, nontoxic salt thereof, wherein

one R_1 and R_2 is fluoro, chloro, bromo, cyano, hydroxyl, azido, amino or nitro and the other is hydrogen; R_1 and R_2 are both fluoro, chloro or bromo; or

R_1 and R_2 taken together are oxo;

R_3 is hydrogen or methyl and

n is 2 to 7.

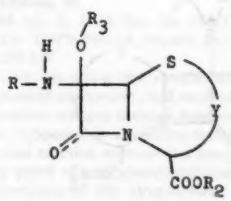
3,954,731

PROCESS FOR PREPARING 6-ALKOXYPENICILLANIC AND 7-ALKOXYCEPHALOSPORIN ACIDS

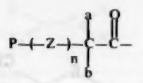
Wayne A. Spitzer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 268,362, July 3, 1972, abandoned. This application Oct. 4, 1973, Ser. No. 403,697
Int. Cl.[2] C07D *499/04*, *501/04*
U.S. Cl. 260—239.1 9 Claims

1. The method for preparing an alkoxylated β-lactam ester of the formula



wherein R is C_2-C_7 alkanoyl, benzoyl, C_1-C_4 lower alkylbenzoyl, halobenzoyl, C_1-C_4 lower alkoxybenzoyl, nitrobenzoyl, hydroxybenzoyl, or a group of the formula



wherein P is phenyl, C_1–C_4 lower alkylphenyl, halophenyl, C_1–C_4 lower alkoxyphenyl, nitrophenyl, hydroxyphenyl, or a heteromonocyclic radical containing O, S, and/or N selected from the group consisting of thienyl, furyl, 2-oxazolyl, 2-thiazolyl, triazinyl, tetrazolyl, 2-imidazolyl, 1,3,4-oxadiazolyl, 1,3,4-thiadiazolyl, 2-pyridyl, 3-pyridyl, pyrimidyl, pyrazinyl, 3-pyrryl, pyranyl and piperidyl; Z is O or S;

n is 0 or 1;

a is hydrogen or C_1–C_3 lower alkyl; and

b is hydrogen, C_1–C_3 lower alkyl, hydroxy, t-butyloxycarbamido, benzyloxycarbamido, 2,2,2-trichloroethoxycarbamido or phthalimido;

R_2 is a carboxylic acid protecting ester forming group;

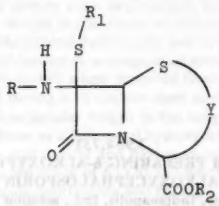
R_3 is C_1–C_4 lower alkyl, benzyl, p-nitrobenzyl or 2,2,2-trichloroethyl; and

Y is the 3-carbon fragment

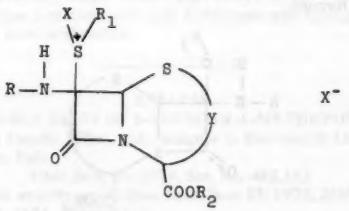
or the substituted 2-carbon fragment

wherein Q is methyl or acetoxymethyl; which comprises the steps of

a. halogenating with chlorine or bromine in an inert solvent a thio substituted β-lactam ester compound of the formula



wherein R_1 is C_1–C_4 lower alkyl or benzyl, and R, R_2 and Y are as defined above, at a temperature between −80° and −25° C. to form the β-lactam halosulfonium halide of the formula



wherein R, R_1, R_2 and Y are as defined above and X is chloro or bromo;

b. adding to said halogenation mixture maintained at a temperature between −80° and −25° C. one equivalent of a hydrogen halide acceptor and at least one molar equivalent of the alcohol R_3OH, wherein R_3 is C_1–C_4 lower alkyl, benzyl, p-nitrobenzyl, or 2,2,2-trichloroethyl; and

c. recovering said alkoxylated β-lactam ester.

3,954,732

PENAM AND CEPHAM DERIVATIVES AND PREPARATION THEREOF

Takashi Kamiya, Suita; Tsutomu Teraji; Masashi Hashimoto, both of Toyonaka; Osamu Nakaguti, Osaka, and Teruo Oku, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

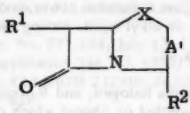
Filed Oct. 19, 1973, Ser. No. 407,962

Claims priority, application Japan, Oct. 20, 1972, 47-105559; Nov. 8, 1972, 47-112348; Nov. 22, 1972, 47-117384; Dec. 13, 1972, 47-125572; Dec. 13, 1972, 47-125573; Dec. 13, 1972, 47-125575; Dec. 13, 1972, 47-125576; Dec. 15, 1972, 47-126637; Dec. 20, 1972, 47-128658; Dec. 20, 1972, 47-128659; Dec. 20, 1972, 47-128660; Dec. 20, 1972, 47-128657; Dec. 21, 1972, 47-128902; Dec. 22, 1973, 48-2270; Dec. 23, 1973, 48-1198; Dec. 23, 1973, 48-1201; Aug. 1, 1973, 48-87108

Int. Cl.² C07D *499/44*

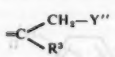
U.S. Cl. 260—239.1 **19 Claims**

1. A compound of the general formula:



wherein R^1 is a conventional, pharmaceutically acceptable acylamino, R^2 is carboxy or a conventionally protected carboxy, X is —S— or

and A′ is a group of the formula:



in which R^3 is lower alkyl and Y″ is a residue of a strong nucleophile selected from the group consisting of pyridylthio, lower alkyl substituted thiadiazolylthio, lower alkyl substituted imidazolylthio and, lower alkyl substituted tetrazolylthio, benzothiazolylthio.

3,954,733

NAPHTHYRIDINE-3-CARBOXAMIDO-BENZYLPENICILLINS AND SALTS THEREOF

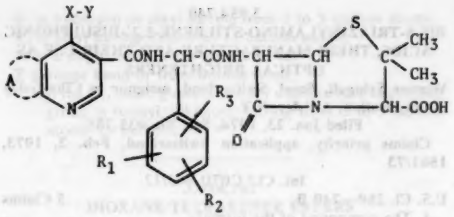
Hisao Tobiki, Toyonaka; Hirotada Yamada; Iwao Nakatsuka, both of Nishinomiya; Kozo Shimago, Takarazuka; Shigeru Okano, Kawanishi; Takenari Nakagome, Nishinomiya; Toshiaki Komatsu, Takarazuka; Akio Izawa, Toyonaka; Hiroshi Noguchi, Takarazuka, and Yasuko Eda, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 13, 1973, Ser. No. 424,271

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **18 Claims**

1. A compound of the formula:



wherein the ring A is an unsubstituted pyridine ring or a pyridine ring having one or more substituents selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, lower haloalkyl, lower alkylenedioxy, halogen, hydroxyl, nitro, amino, lower alkoxycarbonylamino, lower alkylamino, di(lower) alkylamino and lower alkanoylamino, X is oxygen or sulfur, Y is hydrogen, lower alkoxycarbonyl or lower alkanoyl, R_1 is hydroxyl, lower alkanoyloxy, lower alkoxycarbonyloxy or benzyloxycarbonyloxy and R_2 and R_3 are each hydrogen or halogen, and nontoxic pharmaceutically acceptable salts thereof.

3,954,734

NOVEL ANTIBACTERIAL AMIDE COMPOUNDS AND PROCESS MEANS FOR PRODUCING THE SAME

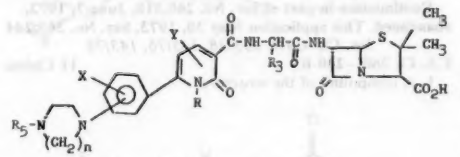
Leonard Doub; James S. Kaltenbronn, and Dieter Schweiss, all of Ann Arbor, Mich., assignors to Parke, Davis & Company, Joseph Campau at the River

Continuation-in-part of Ser. No. 434,763, Jan. 21, 1974, abandoned. This application Dec. 23, 1974, Ser. No. 534,031

Int. Cl.² C07D *499/68, 499/70, 499/66*

U.S. Cl. 260—239.1 **10 Claims**

1. A member of the class consisting of amido compounds of the formula



and pharmaceutically acceptable salts thereof; wherein R is hydrogen or methyl; R_3 is phenyl, p-hydroxyphenyl; 2-thienyl and cyclohexa-1,4-dien-1-yl and R_5 is a lower alkyl group of from 1 to 6 carbon atoms, cyclohexyl, benzyl, phenyl and halophenyl wherein halo represents chlorine, fluorine, bromine or iodo, X is hydrogen, chlorine or bromine; Y is hydrogen or bromine and *n* is two or three with the provisio that when *n* is three R_5 is methyl.

3,954,735

DERIVATIVES OF α-AMINOBENZYLPENICILLIN

Welf von Daehne, Rungsted Kyst, Denmark, assignor to Lovens kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

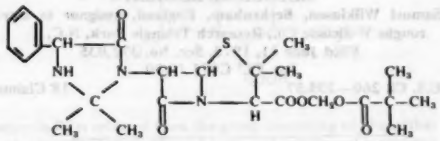
Filed June 7, 1971, Ser. No. 150,824

Claims priority, application United Kingdom, June 17, 1970, 29467/70

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 **3 Claims**

3. A compound selected from the group consisting of the pivaloyloxymethyl ester of hetacillin having the formula



and the pharmaceutically acceptable non-toxic salts thereof.

3,954,736

PRODUCTION OF LACTAMS

Norbert Petri, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 27, 1970, Ser. No. 84,546

Claims priority, application Germany, Nov. 5, 1969, 1955559

Int. Cl.² C07D *201/04*

U.S. Cl. 260—239.3 A **9 Claims**

1. An improved process for the production of lactams having from 5 to 12 ring carbon atoms by rearrangement of a corresponding cycloalkanone oxime at from 210° to 450°C in contact with a supported catalyst in a fluidized bed in a continuous process wherein the improvement consists in introducing steam at the rate of from 0.01 to 1 kg per kg of cycloalkanone oxime introduced, the steam being injected into the space above the fluidized bed.

3,954,737

ATROPISOMERIC ANSA RING COMPOUNDS

Kenneth L. Rinehart, Jr., Urbana, Ill., and Waltraut M. J. Knoll, Vienna, Austria, assignors to University of Illinois Foundation, Urbana, Ill.

Filed Apr. 5, 1974, Ser. No. 458,138

Int. Cl.² C07D *498/18, 491/08, 267/00*

U.S. Cl. 260—239.3 P **6 Claims**

1. A method for preparing the atropisomeric form of a selected streptovaricin compound, said method comprising:

preparing a reaction mixture through dissolving or suspending the said compound in a selected reaction medium;

heat treating said reaction mixture at a temperature below the melting point of said compound and sufficient to promote formation of the atropisomeric form of said compound; and,

isolating the atropisomeric form of said compound from the reaction mixture.

2. The compound, astropisostreptovaricin C.

3,954,738

STABILIZED EPSILON CAPROLACTAM COMPOSITION AND METHOD FOR PREPARING SAME

Jean W. Bouchoux, Nutley, and William A. Larkin, Morristown, both of N.J., assignors to M&T Chemicals Inc., Greenwich, Conn.

Filed Jan. 4, 1974, Ser. No. 430,690
Int. Cl.² C07D 223/10
U.S. Cl. 260—239.3 R 6 Claims

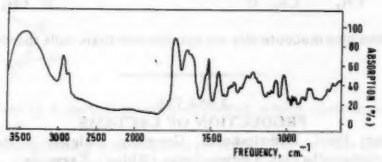
1. An improved composition containing 1) an alkali metal salt of ε-caprolactam wherein said alkali metal is selected from the group consisting of lithium, sodium and potassium, and 2) a stabilizer to inhibit discoloration of said composition, wherein the improvement resides in the presence, as said stabilizer, of a hexaorgano distannane of the formula $R_3^2SnSnR_3^2$ in an amount between SnSnRand 100 percent, based on the weight of said alkali metal salt, wherein R^2 and R^3 each represent an alkyl radical containing from 1 to 20 carbon atoms, inclusive.

3,954,739

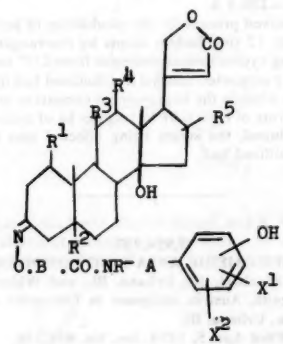
BIOLOGICAL REAGENT

Samuel Wilkinson, Beckenham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed June 21, 1973, Ser. No. 372,035
Int. Cl.² C07J 19/00
U.S. Cl. 260—239.57 18 Claims



1. A compound of formula (VIII)



wherein R^1, R^2, R^3, R^4 and R^5 are each selected from hydrogen and an hydroxyl group and at least four are hydrogen;

B is an alkylene chain of from 1 to 4 carbon atoms;

R is selected from hydrogen and an alkyl group of from 1 to 4 carbon atoms;

A is selected from a bond and a straight or branched, alkylene chain of from 1 to 6 carbon atoms which may be substituted by a carboxyl or carboalkoxy group wherein the alkyl thereof has 1 to 4 carbon atoms; and

X^1 and X^2 are each selected from hydrogen and an iodine radioisotope.

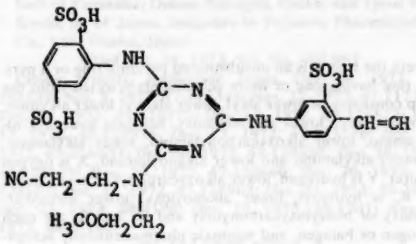
3,954,740

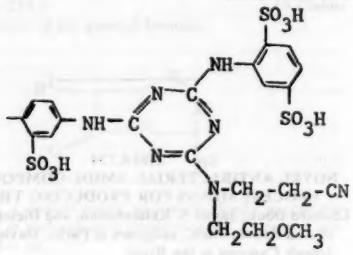
BIS-S-TRIAZINYLAMINO-STILBENE-2,2'-DISULPHONIC ACIDS, THEIR MANUFACTURE AND THEIR USE AS OPTICAL BRIGHTENERS

Werner Fringeli, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 23, 1974, Ser. No. 435,785
Claims priority, application Switzerland, Feb. 2, 1973, 1561/73
Int. Cl.² C07D 403/12
U.S. Cl. 260—240 B 5 Claims

1. The compound of the formula





and the alkali metal, alkaline earth metal, earth metal, ammonium or amine salt thereof.

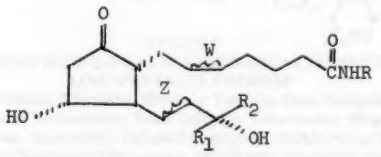
3,954,741

N-SUBSTITUTED PROSTAGLANDIN CARBOXAMIDES

Thomas K. Schaaf, Old Lyme, Conn.; Leonard J. Czuba, Canterbury, England, and Hans-Jurgen E. Hess, Old Lyme, Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 260,518, June 7, 1972, abandoned. This application May 30, 1973, Ser. No. 365,244
Int. Cl.² C07C 333/38, 143/76, 143/78
U.S. Cl. 260—240 R 11 Claims

1. A compound of the structure:



wherein R is alkanoyl having from 2–8 carbon atoms or cycloalkanoyl from 4 to 8 carbon atoms; aryoyl or substituted aryoyl of from 7 to 11 carbon atoms wherein said substituent is methyl, halogen, or methoxy; alkylsulfonyl of from 1 to 7 carbon atoms; arylsulfonyl or substituted arylsulfonyl wherein said substituent is methyl, halogen, or methoxy;

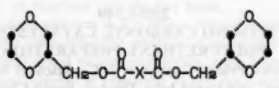
R_1 is hydrogen or alkyl having from 1 to 3 carbon atoms;
R_2 is alkyl having from 5 to 11 carbon atoms;
W is a single bond or cis double bond;
Z is single bond or trans double bond;
and the C_{11} and C_{15} esters thereof wherein said esterifying group is formyl, alkanoyl, having from 2 to 5 carbon atoms, or benzoyl.

3,954,742
DIOXANE TETRAETHER ESTERS

Thomas C. Snapp, Jr.; Alfred G. Robinson, and Alden E. Blood, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1974, Ser. No. 498,167
Int. Cl.² C07D 319/12; C08K 5/15
U.S. Cl. 260—240 J **7 Claims**

1. A compound having the formula:



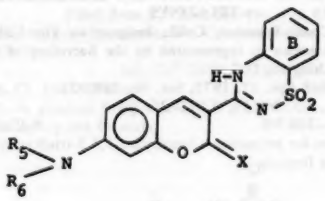
wherein X is an acyclic or alicyclic hydrocarbon or aromatic moiety having 1 to 8 carbon atoms.

3,954,743
COUMARIN AND COUMARINIMIDE DERIVATIVES

Werner Koch, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed July 9, 1973, Ser. No. 377,537
Claims priority, application Switzerland, July 11, 1972, 10355/72; Dec. 15, 1972, 18303/72
Int. Cl.² C07D 285/24
U.S. Cl. 260—243 D **10 Claims**

1. A compound of formula Ia,



Ia

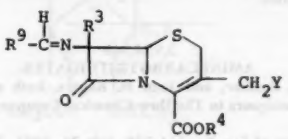
wherein
X is oxygen or NH,
R_5 is alkyl which is unsubstituted or substituted by hydroxy, alkoxy, cyano, formyloxy, alkylcarbonyloxy, alkoxycarbonyloxy, alkoxycarbonyl, benzoyloxy, allyl or phenyl;
R_6 is hydrogen or one of the significances of R_5; and
ring B is unsubstituted or substituted by chloro, bromo, methyl, alkoxy, cyano, thiocyano, trifluoromethyl, alkoxycarbonyl, benzyloxycarbonyl, alkylcarbonyloxy, acetylamino, propionylamino, benzoylamino, aminosulphonyl, alkylaminosulphonyl, dialkylaminosulphonyl, phenylaminosulphonyl or N-alkyl-N-phenylaminosulphonyl; and
the alkyl and alkoxy named contain 1 to 4 carbon atoms.

3,954,744
7-SUBSTITUTED CEPHALOSPORANIC ACID AND DERIVATIVES THEREOF

Joseph Edward Dolfini, Princeton, and Ekkehard Böhme, Hightstown, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 260,620, June 7, 1972, Pat. No. 3,840,533, which is a continuation-in-part of Ser. No. 174,510, Aug. 24, 1971, abandoned. This application June 19, 1974, Ser. No. 480,789
Int. Cl.² C07D 501/60
U.S. Cl. 260—243 C **7 Claims**

1. A compound of the formula:



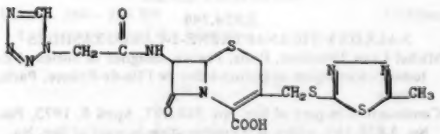
wherein R^3 is selected from the group consisting of phenylthio and substituted phenylthio wherein said substituent is selected from the group consisting of halogen, hydroxy, amino, nitro, and lower alkyl; R^4 is selected from the group consisting of hydrogen, lower alkyl, trichloroethyl, benzyl, methoxybenzyl, and benzhydryl; Y is selected from the group consisting of hydrogen, acetoxy, pyridinium, and hydroxy; and R^9 is selected from the group consisting of phenyl and substituted phenyl wherein said substituent is selected from the group consisting of halogen, lower alkoxy, hydroxy, nitro, amino, and lower alkyl.

3,954,745
PROCESS FOR PREPARING CEFAZOLIN

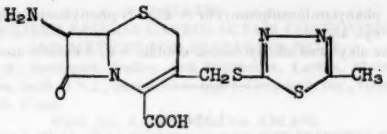
Billy G. Jackson, and Charles W. Ryan, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sept. 12, 1974, Ser. No. 505,304
Int. Cl.² C07D 501/06
U.S. Cl. 260—243 C **9 Claims**

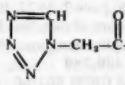
1. In a process for the preparation of a compound of the formula



by reacting a solvate of N, N-dimethylformamide and the hydrochloride salt of a 7-aminocephalosporin compound of the formula



with 1H-tetrazole-1-acetyl chloride of the formula



the improvement which comprises carrying out the reaction in the presence of an originating solvent comprising N,N-dimethylacetamide.

3,954,746

AMINECARBOTRITHIOATES

Joseph E. Dunbar, and Joan H. Rogers, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 166,258, July 26, 1971, Pat. No. 3,810,890, which is a continuation-in-part of Ser. No. 682,511, Nov. 13, 1967, abandoned. This application Oct. 25, 1973, Ser. No. 409,551

Int. Cl.[2] C07D 295/14

U.S. Cl. 260—247.1 T **6 Claims**

1. A compound corresponding to the formula $R_1SSC(=S)$-NR_3R_4 wherein R_1 represents allyl, 2,3,3-tribromoallyl, 2-phenylallyl or propargyl and wherein R_3 and R_4 together with the nitrogen atom represent a 4-morpholinyl or a 1-piperidinyl group.

3,954,747

AMINECARBOTRITHIOATES AND PREPARATION

Joseph E. Dunbar, and Joan H. Rogers, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 166,258, July 26, 1971, Pat. No. 3,810,890, which is a continuation-in-part of Ser. No. 682,511, Nov. 13, 1967, abandoned. This application Oct. 25, 1973, Ser. No. 409,553

Int. Cl.[2] C07D 295/14; C07C 155/04

U.S. Cl. 260—247.1 T **7 Claims**

1. A compound corresponding to the formula $R_3R_4NC(=S)$-$SS(CH_2)_nXR_5$ wherein R_3 and R_4 individually represent loweralkyl or hydrogen, and together with the nitrogen atom represent a piperidino or morpholino group, R_5 represents loweralkyl, phenyl, loweralkylphenyl, loweralkoxyphenyl or halophenyl, X is oxygen or sulfur and n is 1 or 2.

3,954,748

3-ALKOXY-THIANAPTHENE-2-CARBOXAMIDES

Michel Leon Thominet, Paris, France, assignor to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France, Paris, France

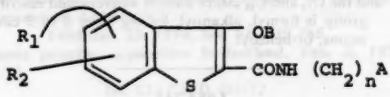
Continuation-in-part of Ser. No. 348,297, April 5, 1973, Pat. No. 3,838,169, which is a continuation-in-part of Ser. No. 140,605, May 5, 1971, Pat. No. 3,745,175, which is a continuation-in-part of Ser. No. 845,509, July 28, 1969, abandoned. This application June 26, 1974, Ser. No. 483,246

Claims priority, application France, July 29, 1968, 68.161060; Oct. 28, 1968, 68.171684

Int. Cl.[2] C07D 333/70

U.S. Cl. 260—247 P **2 Claims**

1. A compound selected from the group consisting of 3-alkoxy-thianaphthene-2-carboxamides and the dioxides thereof and the pharmaceutically acceptable acid addition salts of said carboxamides, said 3-alkoxy-thianaphthene-2-carboxamides having the formula:



in which R_1 and R_2 are the same or different and are hydrogen, alkoxy of less than 5 carbon atoms, halogen, nitro or amino; B is alkyl of less than 5 carbon atoms or allyl; n is 1, 2 or 3; and A is selected from the class consisting of piperidinyl, imidazolidinyl, piperazino, pyrrolidino and morpholino.

3,954,749

BETA-AMINO CARBONYL CATALYSTS FOR POLYURETHANE PREPARATION

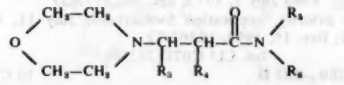
David Charles Priest, Charlotte, N.C.; Michael Ray Sandner, Charleston, and David John Trecker, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 309,906, Nov. 27, 1972, Pat. No. 3,821,131. This application Apr. 23, 1974, Ser. No. 463,247

Int. Cl.[2] C07D 295/00

U.S. Cl. 260—247.2 A **3 Claims**

1. As novel compositions, 3-(N-morpholino)-N',N'-dialkylamides having the formula,



wherein: R_3 and R_4 are hydrogen or alkyl of one to four carbon atoms; and R_5 and R_6 are alkyl of one to four carbon atoms.

3,954,750

PREPARATION OF HEXAHYDRO-1,3,5-TRIALKANOYL-s-TRIAZINES

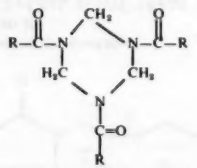
Clifford L. Coon, Fremont, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 17, 1975, Ser. No. 569,032

Int. Cl.[2] C07D 251/04

U.S. Cl. 260—248 NS **8 Claims**

1. A process for preparing a hexahydro-1,3,5-trialkanoyl-s-triazine of the formula



wherein R is an alkyl group of 1 to 20 carbon atoms, which comprises reacting an alkanoic acid amide of the formula $RCONH_2$, wherein R has the foregoing definition, and a polymeric formaldehyde in the presence of sulfuric acid catalyst and an inert organic liquid diluent while removing the water formed in the reaction by distillation with said liquid diluent, wherein the improvement comprises effecting the reaction in the presence of at least 0.05 mol sulfuric acid per mol of said amide.

3,954,751

CONTINUOUS PRODUCTION OF CYANURIC ACID

Hartwig Fuchs, Ludwigshafen; Reinhard Billet, Mannheim; Horst Goelz, Schwetzingen; Hubert Suter, Ludwigshafen, and Karl Von Erden, Altrip, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Dec. 28, 1973, Ser. No. 429,089

Claims priority, application Germany, Jan. 2, 1973, 2300037

Int. Cl.² C07D 251/32

U.S. Cl. 260—248 A 3 Claims

1. A process for the continuous production of cyanuric acid by the pyrolysis of urea in the presence of an inert solvent wherein

a. molten urea or a solution of urea in the solvent is fed into an externally heated tubular reactor or thin-layer reactor in which the urea is decomposed into cyanuric acid and ammonia in the presence of the solvent at a temperature of from 200° to 300°C at a pressure of from 50 to 760 mm at a space-time yield of from 0.1 to 2 kg of cyanuric acid per liter of reaction volume per hour;

b. the reaction mixture is fed into a crystal separation zone and at the same time the mixture of ammonia and vaporous solvent is fed to a condensation zone from which the condensed solvent is returned to the reaction zone;

c. cyanuric acid which has crystallized out from the reaction mixture in the crystal separation zone is transferred in the form of a mash to a falling film evaporator, the residual liquid reaction mixture which has been fed in excess into the crystal separation zone being returned to the reaction zone; and

d. the mash consisting of crystallized cyanuric acid and solvent is freed from solvent in the falling film evaporator at a temperature of from 100° to 250°C and at a pressure of from 1 to 300 mm and the solvent is returned to the reaction zone after condensation.

3,954,752

PROCESS FOR PREPARING 2',3',5'-TRI-O-ACETYL-6-AZAURIDINE

Alois Piskala, and Frantisek Sorm, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

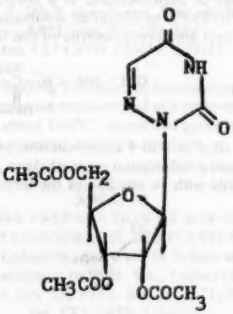
Filed June 5, 1974, Ser. No. 476,459

Claims priority, application Czechoslovakia, June 6, 1973, 4916-73

Int. Cl.² C07D 253/06

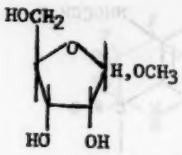
U.S. Cl. 260—248 AS 5 Claims

1. A process for producing 2',3',5'-tri-O-acetyl-6-azauridine having the formula:



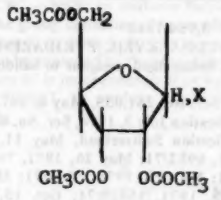
(I)

which consists of the steps of reacting a crude anomeric mixture of methyl D-ribofuranosides having the formula



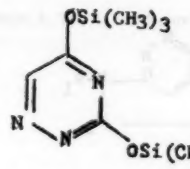
(II)

with anhydrous hydrogen chloride or anhydrous hydrogen bromide in the presence of acetic anhydride and acetic acid to thereby form the corresponding 2,3,5-tri-O-acetyl-D-ribofuranosyl halide having the formula



(III)

wherein X is chloro or bromo, and thereafter reacting the halide of formula III with 3,5-bis-trimethylsilyloxy-1,2,4-triazine having the formula



(IV)

in the presence of an inert solvent of a mercuric halide and recovering the 2',3',5'-tri-O-acetyl-6-azauridine.

3,954,753

2-AROYL-3-AMINO PYRAZINES AND THE 3(-2HALOACETAMIDE DERIVATIVES THEREOF

George Francis Field, West Caldwell; Leo Henryk Sternbach, Upper Montclair, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

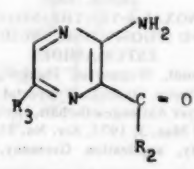
Division of Ser. No. 438,810, Feb. 1, 1974, Pat. No. 3,880,848.

This application Feb. 13, 1975, Ser. No. 549,566

Int. Cl.² C07D 241/14

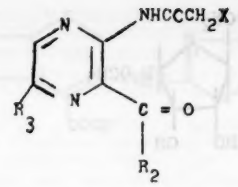
U.S. Cl. 260—250 BN 2 Claims

1. A compound of the formula



wherein R_2 signifies phenyl, halophenyl or pyridyl and R_3 signifies hydrogen or halogen.

2. A compound of the formula



wherein X signifies halogen, R_2 signifies phenyl, halophenyl or pyridyl and R_3 signifies hydrogen or halogen.

3,954,754

3-HYDRAZINO-CYCLOALKYL[C]PYRIDAZINES

Erhard Schenker, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

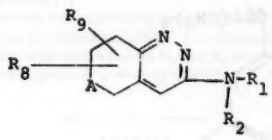
Continuation-in-part of Ser. No. 251,035, May 8, 1972, Pat. No. 3,838,125. This application July 3, 1974, Ser. No. 485,578

Claims priority, application Switzerland, May 11, 1971, 6951/71; May 11, 1971, 6952/71; May 26, 1971, 7679/71; May 26, 1971, 7683/71; May 28, 1971, 7848/71; May 28, 1971, 7849/71; Oct. 15, 1971, 15120/71; Oct. 15, 1971, 15121/71

Int. Cl.² C07D 237/28, 237/26

U.S. Cl. 260—250 C 18 Claims

1. A compound of the formula:



wherein R_1 is amino, or

wherein each of

R_3 and R_4 is alkyl of 1 to 4 carbon atoms, or

R_3 and R_4 together with the carbon atom to which they are bound, form a cycloalkylidene radical of 5 to 12 carbon atoms,

R_2 is hydrogen or methyl;

A is $-(CH_2)_n-$

wherein

n is 0 or an integer from 1 to 7 and R_8 and R_9 are each hydrogen or alkyl of 1 to 4 carbon atoms, or a pharmaceutically acceptable acid addition salt therof.

3,954,755

7-BROMOQUINOXAL-6-YL-(THIONO)-(THIOL)-PHOSPHORIC AND (PHOSPHONIC) ACID ESTERS OF ESTER-AMIDES

Karl-Julius Schmidt, Wuppertal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

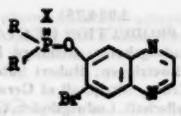
Filed Mar. 3, 1975, Ser. No. 555,201

Claims priority, application Germany, Mar. 5, 1974, 2410311

Int. Cl.² C07F 9/65

U.S. Cl. 260—250 QP 7 Claims

1. A 7-bromoquinoxal(6)yl-(thiono)-(thiol)-phosphoric (phosphonic) acid ester or ester-amide of the formula



in which

R is alkoxy with 1 to 4 carbon atoms, alkyl with 1 to 3 carbon atoms or dialkylamino with 1 to 3 carbon atoms per alkyl moiety,

R′ is alkoxy with 1 to 4 carbon atoms, alkylmercapto with 1 to 6 carbon atoms or dialkylamino with 1 to 3 carbon atoms per alkyl moiety, and

X is oxygen or sulfur.

3,954,756

METHOD FOR PRODUCING PYRIMIDINE

Tetsuo Maruyama; Iwao Mikami, and Kazuo Imaoka, all of Osaka, Japan, assignors to Takeda Chemical Industries Ltd., Osaka, Japan

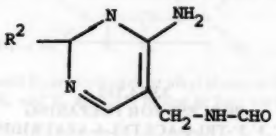
Filed May 10, 1973, Ser. No. 358,965

Claims priority, application Japan, May 12, 1972, 47-47412

Int. Cl.² C07D 239/00

U.S. Cl. 260—256.4 N 8 Claims

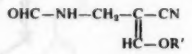
1. A method for the production of a 2-alkyl-4-amino-5-formylaminomethyl pyrimidine of the formula:



wherein R^2 is an alkyl group having 1 to 4 carbon atoms which comprises:

a. reacting β-aminopropionitrile with an alkyl formate having 2 to 5 carbon atoms, and carbon monoxide in the presence of C_{1-4} alkyl alcoholate of an alkali metal at a temperature varying from 0°C to 150°C to obtain the alkali metal salt of α-formyl-β-formylamino propionitrile,

b. reacting said alkali metal salt of α-formyl-β-formylamino propionitrile with C_1-C_4 alkyl esters of sulfuric acid, an alkyl halide or diazomethane at a temperature ranging from 0°C to 150°C to obtain an α-substituted oxymethylene-α-formyl aminopropionitrile of the formula:



wherein R′ is alkyl of 1 to 4 carbon atoms, and

c. reacting said α-substituted oxymethylene-β-formylamino propionitrile with an amidine of the formula

wherein R^2 is as defined above, or a mineral acid salt of said amidine at a temperature varying from about 0°C to 150°C to obtain said 2-alkyl-4-amino-5-formylaminomethyl) pyrimidine.

3,954,757

CONDENSED PYRROLE MERCAPTO COMPOUNDS

Vishwa Prakash Arya, and Kuppuswamy Nagarajan, both of Bombay, India, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

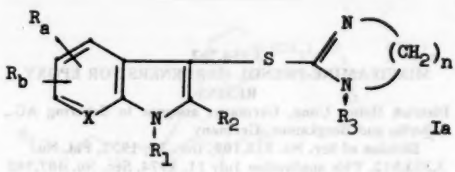
Filed June 11, 1974, Ser. No. 478,197

Claims priority, application Switzerland, June 14, 1973, 8609/73

Int. Cl.² C07D *239/00, 233/04*

U.S. Cl. 260—256.5 R 13 Claims

1. A compound of formula Ia



Ia

wherein X is nitrogen or the group CH, and each of R_a and R_b is hydrogen, lower alkyl, halogen or a lower alkoxy group, each of R_1 and R_3 independently is hydrogen or a lower alkyl group, R_2 is hydrogen, lower alkyl, a free carboxy group or a methoxy- or ethoxycarbonyl group and n is an integer denoting 2–4, or its tautomers or acid addition salts.

3,954,758

PROCESS FOR FLUORINATING URACIL AND DERIVATIVES THEREOF

Paul D. Schuman, Hawthorne; Paul Tarrant, Gainesville; Dale A. Warner, Gainesville, and Geraldine Westmoreland, Gainesville, all of Fla., assignors to PCR, Inc., Gainesville, Fla.

Continuation-in-part of Ser. No. 41,719, May 27, 1970, abandoned, which is a continuation of Ser. No. 709,797, March 1, 1968, abandoned, which is a continuation-in-part of Ser. No. 658,645, Aug. 7, 1967, abandoned. This application Oct. 4, 1971, Ser. No. 186,444

Int. Cl.² C07D *239/54, 239/62*

U.S. Cl. 260—260 10 Claims

1. Method of making 5-fluorouracil consisting essentially of reacting, in an aqueous medium and at a temperature between about 9°C. and about 100°C., uracil and gaseous fluorine, and dehydrating the resulting reaction product.

3,954,759

PROCESS FOR PREPARATION OF 6-SUBSTITUTED 5-FLUOROURACIL DERIVATIVES

Roy Anderson, Gainsville, and Paul D. Schuman, Hawthorne, both of Fla., assignors to PCR, Inc., Gainesville, Fla.

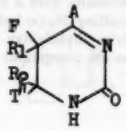
Filed July 13, 1972, Ser. No. 271,490

Int. Cl.² C07D *239/22*

U.S. Cl. 260—260 12 Claims

1. A process for the preparation of 5-fluoro-6-substituted pyrimidine derivatives consisting essentially of reacting at least one pyrimidine derivative of the formula

wherein A is —OH or —NH_2, R_1 is hydrogen, fluorine, chlorine, bromine or lower alkyl and R_2 is hydrogen or lower alkyl, and T is fluorine or lower acyloxy, wherein one or more hydrogen atoms may be substituted by halogen atoms, at a temperature of about −10 to about 72°C., with a compound having the formula T''H wherein T'' is —OH, —$OC(R')_3$, —SR, —OOCR', —NRR' or mixtures thereof wherein R is selected from the group consisting of lower alkyl and lower cycloalkyl, wherein one or more hydrogen atoms of the alkyl, or cycloalkyl may be replaced by fluorine, chlorine, or bromine atoms, and each R' is independently R or hydrogen, and wherein T'' differs from T, to produce a pyrimidine compound of the formula:



wherein A, T'', R_1 and R_2 are defined hereinabove.

3,954,760

PROCESS FOR PRODUCING N_1-(α-BUTYROLACTONE- AND N_1(α-VALEROLACTONE)-5-SUBSTITUTED URACILS

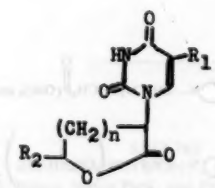
Solomon Aronovich Giller, ulitsa Pernavas, 10, kv. 76; Regina Abramovna Zhuk, ulitsa Gorkogo, 77, kv. 20, and Anna Eduardovna Berzinya, ulitsa Raunas, 35/2, kv. 29, all of Riga, U.S.S.R.

Filed July 16, 1973, Ser. No. 379,731

Int. Cl.² C07D *239/54*

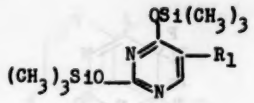
U.S. Cl. 260—260 3 Claims

1. A process for producing a compound of the formula:

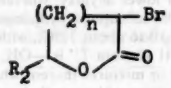


(I)

wherein R_1 is selected from the group consisting of hydrogen, methyl, a trihalomethyl, and a halogen; R_2 is selected from the group consisting of hydrogen and an alkyl; $n = 1$ to 2, consisting essentially of reacting a bis(trimethylsilyl)-5-substituted uracil of the formula:



wherein R_1 is selected from the group consisting of hydrogen, methyl, a trihalomethyl, and a halogen, with an α-bromolactone of the formula:



wherein R_2 is selected from the group consisting of hydrogen and an alkyl; $n = 1$ to 2,

at a temperature ranging from 80° to 160°C; distilling off trimethylbromosilane formed in the reaction from the reaction mixture; treating the reaction mixture freed from the trimethylbromosilane with a lower aliphatic alcohol to convert the resulting N_1-(α-butyrolactone)-or N_1-(α-valerolactone)-4-trimethylsilyloxy-5-substituted pyrimidin-2(1H)-one into the compound of formula I.

3,954,761

PIPERAZINE PHOSPHONIC ACIDS

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

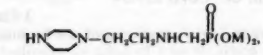
Division of Ser. No. 768,509, Oct. 17, 1968, Pat. No. 3,674,804. This application Aug. 26, 1971, Ser. No. 175,315

Int. Cl.² C07D 295/12

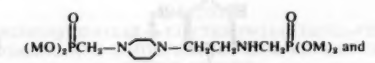
U.S. Cl. 260—268 K **6 Claims**

1. The piperazine phosphonic acids and derivatives thereof selected from the group consisting of

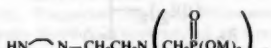
(1)



2. a mixture of



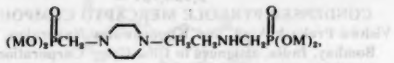
and

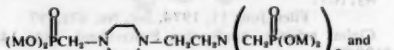


(3)

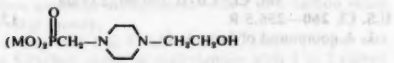
and

4. a mixture of





and



where M is hydrogen, alkali metal, ammonium, triethanolamine or diethanolamine.

3,954,762

MIXED AMINE-PHENOL HARDENERS FOR EPOXY RESINS

Dietrich Helm, Unna, Germany, assignor to Schering AG., Berlin and Bergkamen, Germany

Division of Ser. No. 318,109, Dec. 26, 1972, Pat. No. 3,853,812. This application July 11, 1974, Ser. No. 487,742

Claims priority, application Germany, Jan. 7, 1972, 2200717

Int. Cl.² C07D 295/12

U.S. Cl. 260—268 PL **1 Claim**

1. An association product consisting essentially of, in admixture,

a. a polyamine having 3 – 5 amino hydrogen atoms, selected from the group consisting of N-aminoalkyl piperazines and amines of aliphatic, cycloaliphatic, and araliphatic hydrocarbons and ether-hydrocarbons;

b. a primary monoamine of an aliphatic, cycloaliphatic, or araliphatic hydrocarbon; and

c. an alkylmonophenol; said mixture having from 0.3 to 3 equivalents of monoamine amino hydrogen per equivalent of polyamine amino hydrogen and 0.25 to 1 equivalent of alkylmonophenol per equivalent of total amino nitrogen and (a), (b), and (c) being liquid at room temperature.

3,954,763

N-METATRIFLUOROMETHYLTHIOPHENYL-PIPERAZINE

Don Pierre René Lucien Giudicelli, Fontenay-sous-Bois, and Henry Najer, Paris, both of France, assignors to Synthelabo, Paris, France

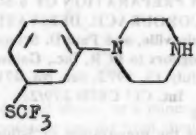
Continuation-in-part of Ser. No. 349,869, April 10, 1973, abandoned. This application Oct. 2, 1973, Ser. No. 402,783

Claims priority, application France, Apr. 10, 1972, 72.12442

Int. Cl.² C07D 295/08

U.S. Cl. 260—268 PH **1 Claim**

1. The N-(m-trifluoromethylthio-phenyl)-piperazine of the formula



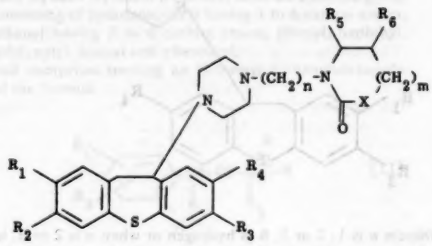
and its salts with any inorganic or organic acid.

3,954,764
DIBENZO[b,f]THIEPINS BEARING PIPERAZINYL SUBSTITUTION

Max Gerecke, Reinach; Jean-Pierre Kaplan, Le Plessis Robinson, and Emilio Kyburz, Reinach, all of Switzerland, assignors to Hoffmann-la Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 378,732, July 12, 1973, abandoned. This application May 17, 1974, Ser. No. 471,094
Claims priority, application Switzerland, Mar. 30, 1973, 4605/73; Jan. 14, 1974, 448/74
Int. Cl.² C07D *295/12*
U.S. Cl. 260—268 TR **15 Claims**

1. A compound of the formula



wherein one of R_1 and R_2 is hydrogen and the other is methyl, methoxy, methylthio, dimethylsulfamoyl, chloro, fluoro or trifluoromethyl; one of R_3 and R_4 is hydrogen and the other is methyl, methoxy, methylthio, dimethylsulfamoyl, chloro, fluoro or trifluoromethyl; *n* is 2 or 3; *m* is 0; X is oxygen, and R_5 and R_6 are hydrogen or taken together are the group

or a salt thereof with a pharmaceutically acceptable acid.

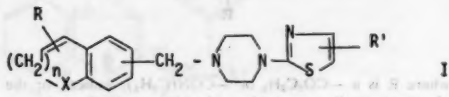
3,954,765
PIPERAZINES DERIVATIVES

Gilbert Regnier, Chatenay-Malabry; Roger Canevari, Villebon-sur-Yvette; Michel Laubie, Vaucresson, and Jean-Claude Poignant, Bures-sur-Yvette, all of France, assignors to Science-Union et Cie, France

Filed Oct. 7, 1974, Ser. No. 512,461
Claims priority, application United Kingdom, Oct. 30, 1973, 50309/73
Int. Cl.² C07D *295/12*
U.S. Cl. 260—268 BC **15 Claims**

1. A compound selected from the group consisting of:

A. compounds of the formula I:



I

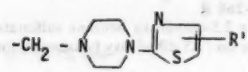
wherein:

n is selected from 0 and .,

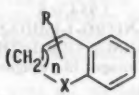
X is selected from the group consisting of oxygen and sulfur,

R and R', which are the same or different, are each selected from the group consisting of hydrogen and alkyl having from 1 to 5 carbon atoms inclusive, and

the group:



is always bonded to the benzene ring in the group:



and,

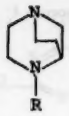
B. Physiologically tolerable acid addition salts thereof.

3,954,766
1,4-DIAZABICYCLO[3.2.1]OCTANES

David W. Henry, Menlo Park, and Priscilla A. Sturm, Mountain View, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed July 9, 1975, Ser. No. 594,510
Int. Cl.² C07D *487/08*
U.S. Cl. 260—268 BF **3 Claims**

1. A compound of the formula



where R is a $-CO_2C_2H_5$ or $-CON(C_2H_5)_2$ radical, or the pharmaceutically acceptable acid addition salts thereof.

3,954,767

PIPERAZINE SALTS OF 2,5-DIHYDROXY BENZENE SULFONIC ACID MONO- AND DIESTERS

Antonio Esteve-Subirana, Avenida Virgen de Montserrat 221, Barcelona 13, Spain

Continuation-in-part of Ser. No. 360,394, May 14, 1973, Pat. No. 3,876,651. This application Sept. 13, 1974, Ser. No. 505,934

Claims priority, application Switzerland, May 17, 1972, 7327/72; Sept. 11, 1973, 12968/73; May 8, 1974, 6288/74

Int. Cl.² C07D *295/00*

U.S. Cl. 260—268 R 7 Claims

1. Piperazine 2,5-dihydroxy benzene sulfonate dibenzoate.

2. Piperazine bis (2,5-dihydroxy benzene sulfonate dibenzoate).

3. The piperazine salt with two moles of mono-2-O-(p-chloro phenoxy isobutyroyl)-2,5-dihydroxy benzene sulfonic acid.

6. The piperazine salt of one or two moles of mono-5-O-(p-chlorophenoxy isobutyroyl)-2,5-dihydroxy benzene sulfonic acid.

7. The piperazine salt of one or two moles of di-O-(p-chloro phenoxy isobutyroyl)-2,5-dihydroxy benzene sulfonic acid.

3,954,768

2-(2-METHYL-5-NITRO-1-IMIDAZOLYL)ETHYL CYCLOAMINOCARBODITHIOATES

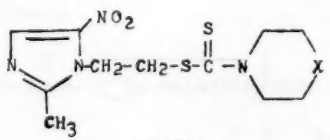
Eunice M. Kreider, Chicago, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 268,749, July 3, 1972, abandoned. This application Apr. 23, 1974, Ser. No. 463,295

Int. Cl.² C07D *295/14*

U.S. Cl. 260—268 H 3 Claims

1. A compound of the formula



wherein X is β-hydroxyethylimino or β-hydroxyethylmethylene.

3,954,769

DIBENZO[b,f]THIEPINS

Max Gerecke, Reinach; Jean-Pierre Kaplan, Le Plessis Robinson, and Emilio Kyburz, Reinach, all of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

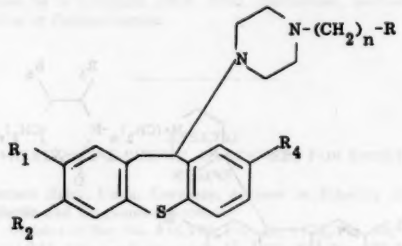
Continuation-in-part of Ser. No. 378,731, July 12, 1973, abandoned. This application May 17, 1974, Ser. No. 471,100

Claims priority, application Switzerland, Mar. 30, 1973, 4604/73; Jan. 16, 1974, 567/74

Int. Cl.² C07D *295/08*

U.S. Cl. 260—268 TR 9 Claims

1. A compound of the formula



wherein *n* is 1, 2 or 3; R is hydrogen or when *n* is 2 or 3, is hydroxy; one of R_1 and R_2 is hydrogen and the other is methoxy; and R_4 is methylthio,

or a pharmaceutically acceptable acid addition salt thereof.

3,954,770

N,N'-(POLYBROMOPHENOXYCARBONYL)PIPERAZINES

Horst Mayerhoefer, Oberwil; Wolfgang Mueller, Neuallschwil; Urs Sollberger, Fullinsdorf, and Anton Voykowitsch, Binningen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

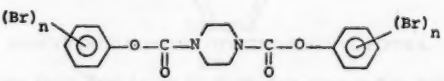
Filed Oct. 31, 1974, Ser. No. 519,402

Claims priority, application Switzerland, Nov. 6, 1973, 15597/73; Mar. 1, 1974, 2934/74

Int. Cl.² C07D *295/20*

U.S. Cl. 260—268 C 4 Claims

1. A compound, of the formula



in which

each *n*, independently, is an integer 2 to 5.

3,954,771

PROCESS FOR THE PREPARATION OF 2H-3-ISOQUINOLONES

Jean-Pierre Jules Geerts, and Raymond Armand Linz, both of Brussels, Belgium, assignors to UCB, Societe Anonyme, Saint-Gilles-lez-Bruxelles, Belgium

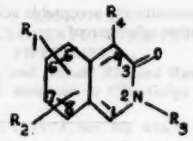
Filed May 31, 1973, Ser. No. 365,723

Claims priority, application United Kingdom, June 16, 1972, 28226/72

Int. Cl.² C07D *217/32*

U.S. Cl. 260—283 SY 14 Claims

1. A process for the preparation of 2H-3-isoquinolone having the formula

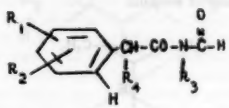


(I)

wherein R_1 represents a member selected from the group consisting of hydrogen, chlorine, fluorine, alkyl having 1 to 6 carbon atoms and alkoxy having 1 to 6 carbon atoms, R_2 represents a member selected from the group consisting of hydrogen and alkyl having 1 to 6 carbon atoms, and

R_3 and R_4 each represent a member selected from the group consisting of hydrogen, alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, phenyl, naphthyl, tolyl, xylyl, benzyl and phenethyl,

which comprises treating an N-formyl-2-phenylacetamide of the formula



(II)

wherein R_1, R_2, R_3 and R_4 have the same meanings as above, with sulfuric acid at a temperature between 0° and 60°C to cyclize the acetamide compound.

3,954,772

DESCARBOXYLYSERGIC ACID

Nicholas J. Bach; David A. Hall, and Edmund C. Kornfeld, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 389,281, Aug. 17, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,395

Int. Cl.² C07D *457/00*

U.S. Cl. 260—285.5 **4 Claims**

1. The process for preparing descarboxylysergic acid which comprises the steps of oxidizing 2,3-dihydro-8β-hydroxy-6-methyl-9-ergolene with manganese dioxide to form 6-methyl-9-ergolene-8-one, reacting said ketone with ethanedithiol in the presence of an acid catalyst to form the corresponding ethylene dithioketal, desulfurizing said dithioketal with Raney nickel and then isolating descarboxylysergic acid thus produced.

3,954,773

4-DESACETOXYVINBLASTINE

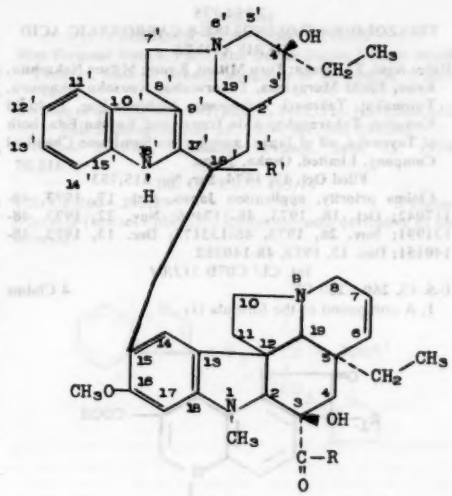
Norbert Neuss, and Albert J. Barnes, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 21, 1974, Ser. No. 525,712

Int. Cl.² C07D *471/18, 471/22*

U.S. Cl. 260—286 R **4 Claims**

1. A compound of the formula



wherein R and R′ are OCH_3 and

respectively or are NH—NH_2 and H, respectively.

3,954,774

N-SUBSTITUTED-7,8-DIHYDROXYCYCLOPENTANO[F]-1,2,3,4-TETRAHYDROISOQUINOLINES AND ETHERS AND ESTERS THEREOF

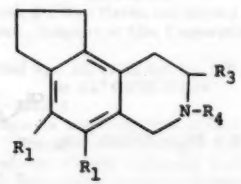
Ian William Mathison; William Ebenezer Solomons, both of Memphis, Tenn., and Raymond Henry Jones, Northport, N.Y., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Mar. 28, 1974, Ser. No. 455,673

Int. Cl.² C07D *217/18, 217/06, 217/16*

U.S. Cl. 260—287 CF **22 Claims**

1. A compound of the formula



wherein R_1 represents hydroxy, alkoxy groups having 1 to 8 carbon atoms or alkanoyloxy groups having 1 to 8 carbon atoms, R_3 represents hydrogen or an alkyl group having 1 to 8 carbon atoms, and R_4 represents an alkyl group, phenyl-carbonyl, 3,4-dimethoxybenzoyl, phenyl-alkyl, β-3,4-dimethoxyphenylethyl, 3,4-dimethoxybenzyl, benzhydryl-alkyl, alkanoyl, phenyl-alkanoyl, 3,4-dimethoxyphenylacetyl or benzhydrylalkanoyl groups in which groups represented by R_4 the alkyl and alkanoyl groups have 1 to 8 carbon atoms, and nontoxic acid addition salts thereof.

3,954,775

THIAZOLO(5,4-F)QUINOLINE-8-CARBOXYLIC ACID DERIVATIVES

Hideo Agui, Toyonaka; Toru Mitani, Kyoto; Mitsuo Nakashita, Kobe; Eiichi Murayama, Takarazuka; Kousaku Okamura, Toyonaka; Takenari Nakagome, Nishinomiya; Toshiaki Komatsu, Takarazuka; Akio Izawa, and Yasuko Eda, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

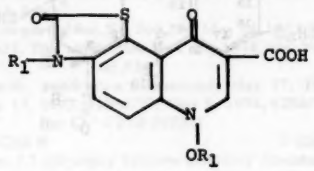
Filed Oct. 17, 1974, Ser. No. 515,753

Claims priority, application Japan, Oct. 17, 1973, 48-117042; Oct. 18, 1973, 48-117496; Nov. 22, 1973, 48-131991; Nov. 26, 1973, 48-133175; Dec. 13, 1973, 48-140151; Dec. 13, 1973, 48-140152

Int. Cl.[2] C07D *513/04*

U.S. Cl. 260—287 CF 4 Claims

1. A compound of the formula (I)



wherein R_1 is a straight chain C_1–C_4 alkyl group, a straight chain C_2–C_4 alkenyl group or a benzyl group, and the pharmaceutically acceptable salts thereof.

3,954,776

1-[METHYLATED PIPERIDINO(AND PYRROLIDIN-1-YL)]-3-(SUBSTITUTED PHENOXY)-2PROPANOLS

Tomio Muro; Sogo Fukuzawa, both of Nakatsu; Yasuaki Chihara, Fukuoka; Tohru Nakao, Fukuoka, and Kiyoshi Ogawa, Fukuoka, all of Japan, assignors to Yoshitomi Pharmeceutical Industries, Ltd., Osaka, Japan

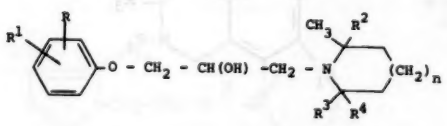
Filed Aug. 23, 1974, Ser. No. 499,948

Claims priority, application Japan, Aug. 23, 1973, 48-94977; Aug. 23, 1973, 48-94978

Int. Cl.[2] C07D *211/14*

U.S. Cl. 260—293.67 16 Claims

1. A compound of the formula:



wherein R is a 2-thienylmethyl group, a 2-pyridylmethyl group, a 2-pyridyl group, a tetrahydrofurfuryloxy group, a furfuryloxy group or a 2-pyridyloxy group; R^1 is a hydrogen atom, a lower alkyl group or a halogen atom; R^2, R^3 and R^4 are each a hydrogen atom or a methyl group; and n is zero or 1; and pharmaceutically acceptable acid addition and quaternary ammonium salts thereof.

3,954,777

AMINOPROPIONYL DERIVATIVES OF 2,3-DIPHENYL CYCLOPROPYLAMINE

Uberto Teotino; Davide Della Bella, both of Milan, and Dario Chiarino, Monza (Milan), all of Italy, assignors to Zambon S.p.A., Milan, Italy

Filed Feb. 26, 1971, Ser. No. 119,347

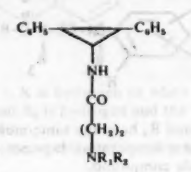
Claims priority, application Italy, Mar. 3, 1970, 21403/70

The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.

Int. Cl.[2] C07D *295/14*

U.S. Cl. 260—293.76 3 Claims

1. A compound of formula



wherein R_1 is H or lower alkyl,

R_2 is H, lower alkyl, benzyl or together with R_1 and the nitrogen atom to which they are bound, is pyrrolidino or piperidino as well as the non-toxic salts thereof with organic and inorganic acids.

3,954,778

AMINOACETYL DERIVATIVES OF 2,3-DIPHENYL CYCLOPROPYL AMINE

Uberto Teotino; Davide Della Bella, both of Milan, and Dario Chiarino, Monza, all of Italy, assignors to Zambon S.p.A., Milan, Italy

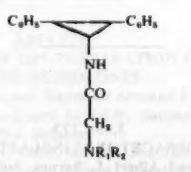
Filed Feb. 26, 1971, Ser. No. 119,346

Claims priority, application Italy, Mar. 3, 1970, 21404/70

Int. Cl.[2] C07D *295/14*

U.S. Cl. 260—293.76 3 Claims

1. A compound of formula



wherein R_1 is H or lower alkyl R_2 is H, lower alkyl or together with R_1 and the nitrogen atom to which they are bound, is pyrrolidino or piperidino.

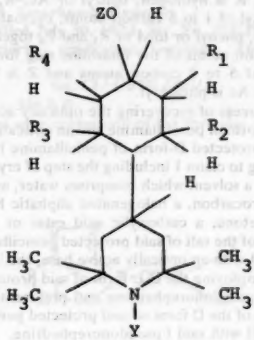
and their non toxic acid addition salts with pharmaceutically suitable organic or inorganic acid.

3,954,779
4-(4'-HYDROXYCYCLOHEXYL)-2,2,6,6-TETRAMETHYL PIPERIDINES

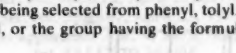
Malcolm John Smith, and Donald Richard Randell, both of Stockport, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,919
Claims priority, application United Kingdom, Apr. 5, 1973, 16248/73
Int. Cl.² C07D 211/22
U.S. Cl. 260—293.65 10 Claims

1. A compound having the formula:



wherein R_1, R_2, R_3 and R_4 are the same or different and each is hydrogen, an alkyl having from 1 to 9 carbon atoms, a cycloalkyl having from 5 to 14 carbon atoms or a cycloalkyl-alkyl having from 7 to 14 carbon atoms, Y is hydrogen, O, an alkyl having from 1 to 4 carbon atoms, or an aralkyl having from 7 to 12 carbon atoms and being selected from the group selected of benzyl, α-methylbenzyl, p-methylbenzyl and α-naphthylbenzyl, and Z is hydrogen, an unsubstituted alkyl or alkyl substituted by hydroxy or cyano groups, said alkyl groups having from 1 to 20 carbon atoms, an alkenyl or alkynyl having from 2 to 20 carbon atoms, a cycloalkyl having from 5 to 12 carbon atoms, an aralkyl having from 7 to 12 carbon atoms and being selected from benzyl, α, α-dimethylbenzyl and α-methylbenzyl, an aryl having from 6 to 12 carbon atoms and being selected from phenyl, tolyl, naphthyl and p-t-butylphenyl, or the group having the formula:



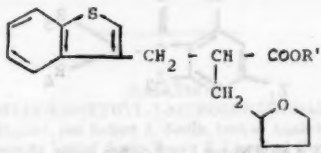
wherein Z_1 has the same significance as Z as hereinbefore defined, or Z_1 is a group $-NR_5R_6$ wherein R_5 is hydrogen or an alkyl having 1 to 4 carbon atoms and R_6 is hydrogen, an alkyl group having from 1 to 20 carbon atoms, a cycloalkyl group having from 5 to 12 carbon atoms, an aralkyl having from 7 to 12 carbon atoms as defined above or an aryl having from 6 to 12 carbon atoms as defined above, or hydrogen chloride, sulfuric acid, phosphoric acid, carbonic acid, acetic acid, maleic acid, malic acid, oxalic acid or tartaric acid salt of a compound of Formula I.

3,954,780
PROPIONIC ACID DERIVATIVES

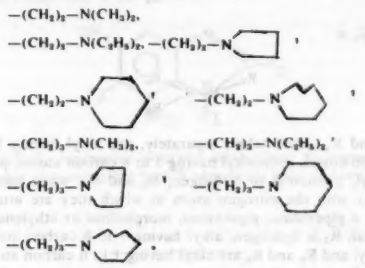
Max Fernand Robba, Paris, and Denise Jeanne Claude Duval, Yvelines, both of France, assignors to Innothera, Arcueil, France

Division of Ser. No. 150,747, June 7, 1971, Pat. No. 5,865,842.
This application July 18, 1974, Ser. No. 489,545
Claims priority, application France, June 12, 1970, 70.21679
Int. Cl.² C07D 295/14
U.S. Cl. 260—293.57 3 Claims

1. A β-[benzo(b)thienyl-3]propionic acid derivative of the formula



wherein R' is selected from the group consisting of



3,954,781
PROCESS FOR PREPARING BIS(2-PYRIDYL-1-OXIDE) DISULFIDE

Haywood Hooks, Jr., West Haven, and James J. Pitts, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 22, 1975, Ser. No. 570,935
Int. Cl.² C07D 213/34
U.S. Cl. 260—294.8 J 11 Claims

1. In a process for preparing bis-(2-pyridyl-1-oxide) disulfide wherein 2-chloropyridine is oxidized with peracetic acid to form a reaction mixture containing 2-chloropyridine-1-oxide which is mercaptized to form a solution of 2-mercaptopyridine-1-oxide, the improvement which comprises:

Reacting 2-mercaptopyridine-1-oxide with hypochlorous acid, said hypochlorous acid being generated in situ by chlorinating said solution with about 1.0–2.0 moles of gaseous chlorine per mole of 2-mercaptopyridine-1-oxide at a pH controlled within the range of 4–12 with a base selected from the group consisting of alkali metal hydroxide, alkali metal bicarbonate, alkali metal carbonate and mixtures thereof, said base being utilized in an amount sufficient to maintain said pH within said pH range during chlorination and to produce a reaction mixture having a terminal pH in the range of 4–8.

3,954,782
2,6-HYDRAZINO-3-PYRIDINE CARBOXYAMIDES

Erwin Fleckenstein, Hofheim, Taunus; Ernst Heinrich, Frankfurt am Main-Fechenheim, and Reinhard Mohr, Offenbach-Rumpenheim, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

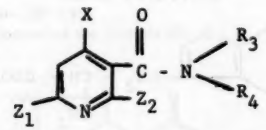
Division of Ser. No. 372,024, June 21, 1973. This application Nov. 6, 1974, Ser. No. 521,408

Claims priority, application Germany, June 22, 1972, 2230392

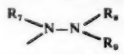
Int. Cl.² C07D 295/12

U.S. Cl. 260—295.5 A **3 Claims**

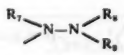
1. A compound of the formula



wherein X is alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, phenyl, benzyl, phenethyl or hydrogen; Z_1 is



and Z_2 is



R_3 and R_4, when taken separately, are alkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, phenyl, benzyl, phenethyl or hydrogen; R_3 and R_4, when taken together with the nitrogen atom to which they are attached, form a piperidino, piperazino, morpholino or ethyleneimino radical; R_7 is hydrogen, alkyl having 1 to 6 carbon atoms or phenyl and R_8 and R_9 are alkyl having 1 to 6 carbon atoms or phenyl.

3,954,783
RESOLUTION PROCESS AND SALT OF PROTECTED D-PENICILLAMINE AND L-PSEUDONOREPHEDRINE

Paul Scherberich, Neu Isenburg, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

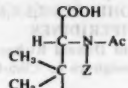
Filed Jan. 25, 1974, Ser. No. 436,787

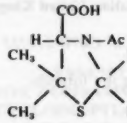
Claims priority, application Germany, Jan. 27, 1973, 2304055

Int. Cl.² C07D 277/06

U.S. Cl. 260—306.7 C **29 Claims**

1. The optically active salt of a protected D-form of penicillamine and l-pseudonoresphedrine where the protected penicillamine has the formula

I  or

II 

where Ac is benzoyl, tosyl, nitrophenyl-sulfenyl, formyl, acetyl or propionyl, R is hydrogen, benzyl or Ac, R_1 and R_2 are hydrogen, alkyl of 1 to 8 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, phenyl or tolyl or R_1 and R_2 together with the adjacent carbon atoms of the thiazoline ring form a cycloalkylene ring of 5 to 8 carbon atoms and Z is hydrogen or together with Ac is phthaloyl.

15. In a process of recovering the optically active salt of a protected D-form of penicillamine and an optically active base wherein the protected D-form of penicillamine has formula I or II according to claim 1 including the step of crystallizing out of solution in a solvent which comprises water, an alkanol, an aliphatic hydrocarbon, a halogenated aliphatic hydrocarbon, dioxane, a ketone, a carboxylic acid ester or an aromatic hydrocarbon of the salt of said protected penicillamine having formula I or II with an optically active base, the improvement comprising employing the D,L form of said protected penicillamine and l-pseudonorephedrine and preferentially precipitating the salt of the D form of said protected penicillamine of formula I or II with said l-pseudonorephedrine.

3,954,784
IMIDAZO[2,1-B]THIAZOLE AND THIAZOLO[3,2-A]-BENZIMIDAZOLE QUATERNARY SALTS AS HYPOGLYCEMIC AGENTS AND GROWTH PROMOTANTS

Richard M. Acheson, Oxford; John K. Stubbs, Deal; Charles A. R. Baxter, Sandwich, all of England, and Donald E. Kuhla, Gales Ferry, Conn., assignors to Pfizer Inc., New York, N.Y.

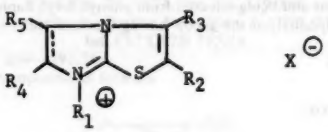
Filed Sept. 19, 1974, Ser. No. 507,384

Claims priority, application United Kingdom, Sept. 20, 1973, 44199/73

Int. Cl.² C07D 513/04

U.S. Cl. 260—306.7 R **16 Claims**

1. A compound of the formula



wherein

X is a pharmaceutically acceptable anion;

R_1 is selected from the group consisting of propargyl, benzyl, phenethyl, and substituted benzyl wherein said substituent is selected from the group consisting of fluoro, chloro, methoxy, trifluoromethyl, methyl, cyano, phenyl and dichloro;

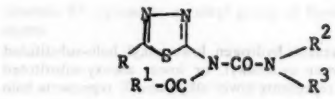
R_2 is selected from the group consisting of hydrogen and alkyl having from one to three carbon atoms;

R_3 is selected from the group consisting of hydrogen, alkyl having from one to three carbon atoms, adamantyl, phenyl and substituted phenyl wherein said substituent is

selected from the group consisting of dimethyl and dimethoxy;
R_2 and R_3 when taken together is tetramethylene;
R_4 is selected from the group consisting of hydrogen, alkyl having from one to three carbon atoms, phenyl, dimethylphenyl and chlorophenyl;
R_5 is hydrogen and
R_4 and R_5 when taken together with the carbon atoms to which they are attached form an *o*-phenylene ring.

3,954,785
ACYLATED UREA COMPOUNDS AND HERBICIDAL COMPOSITIONS
Carl Metzger, Dormagen; Ludwig Eue, and Wilfried Faust, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed July 30, 1974, Ser. No. 493,198
Claims priority, application Germany, Aug. 10, 1973, 2340570
Int. Cl.² C07D *285/12*
U.S. Cl. 260—306.8 D **16 Claims**

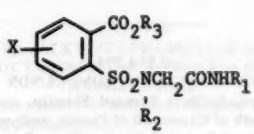
1. Acylated urea compound of the formula:



wherein
R^1 is methyl;
R^2 and R^3 are individually selected from alkyl and alkenyl of up to four carbon atoms; and
R is alkyl of from two to six carbon atoms, benzylthio, benzylsulfonyl, benzylsulfoxyl, alkylthio, alkylsulfonyl, alkylsulfoxyl or haloalkyl, wherein the alkyl moieties contain from one to four carbon atoms.

3,954,786
ISOXAZOLE INTERMEDIATE COMPOUNDS
Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.
Division of Ser. No. 462,212, April 19, 1974, which is a division of Ser. No. 353,607, April 23, 1973, Pat. No. 3,853,862. This application Apr. 4, 1975, Ser. No. 565,229
Int. Cl.² C07D *261/08*
U.S. Cl. 260—307 H **2 Claims**

1. A compound of the formula:



wherein R_1 is 5-methyl-3-isoxazolyl;
R_2 is alkyl having from 1 to 3 carbon atoms;
X is selected from the group consisting hydrogen, methyl, methoxy, fluoro, chloro and bromo and
R_3 is alkyl having 1 to 3 carbon atoms.

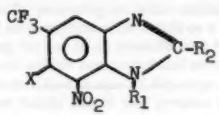
3,954,787
STABILIZED E-SERIES PROSTAGLANDINS
Donald C. Monkhouse, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.
Division of Ser. No. 480,354, June 18, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 601,038
Int. Cl.² A61K *31/16, 31/19;* **C07C** *61/38;* **C07D** *257/06*
U.S. Cl. 260—308 D **11 Claims**

1. A lyophilized pharmaceutical composition comprising a biologically active prostaglandin of the E-series together with a storage stabilizing amount of succinic acid in a weight/weight ratio of 1:1 to 1:200.

5. The composition of claim 1 wherein said prostaglandin is 16-phenyl-13,14-dihydro-w-tetranor-PGE_2, para-biphenyl ester.

3,954,788
5-TRIFLUOROMETHYL-7-NITROBENZIMIDAZOLES
Don L. Hunter, and Robert A. Smith, both of Anaheim, Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.
Continuation-in-part of Ser. No. 344,326, March 23, 1973, abandoned. This application June 24, 1974, Ser. No. 482,043
Int. Cl.² C07D *235/08, 235/24*
U.S. Cl. 260—309.2 **6 Claims**

1. A compound of the formula



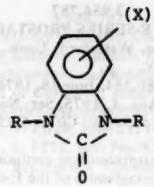
in which R_1 represents di-lower alkylamino; R_2 represents hydrogen or lower alkyl; and X represents halo or lower alkoxy.

3,954,789
2-NITROIMIDAZOLE DERIVATIVES
Bruno Cavalleri, Milan, and Giancarlo Lancini, Pavia, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy
Filed July 26, 1972, Ser. No. 275,415
Claims priority, application Italy, July 30, 1971, 42978/71
Int. Cl.² C07D *233/91*
U.S. Cl. 260—309 **4 Claims**

1. A compound of the group consisting of 1-methyl-2-nitro-5-imidazolecarboxaldehyde, 1-ethyl-2-nitro-5-imidazolecarboxaldehyde and a-(1-methyl-2-nitro-5-imidazolyl)-N-methylnitrone.

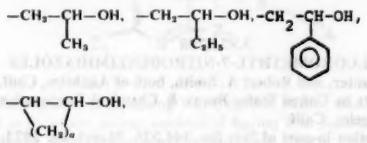
3,954,790
HALOGEN-SUBSTITUTED BENZIMIDAZOLONE COMPOUNDS
Jürgen Habermeier, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Nov. 5, 1974, Ser. No. 521,228
Claims priority, application Switzerland, Nov. 13, 1973, 15953/73
Int. Cl.² C07D *235/26*
U.S. Cl. 260—309.2 **21 Claims**

1. A benzimidazolone compound of the formula I



(I)

wherein X independently denotes chlorine or bromine, *n* denotes a number from 2 to 4, and R denotes a radical selected from the group consisting of $-CH_2-OH$, $-CH_2-CH_2-OH$,



a = 3 or 4, $-CH_2-CH-CH_2OH$, $-CH_2-CH_2-CN$, $-CH_2-CH_2-COOR_2$, $-CH_2-COOR_2$, R_2 representing H or alkyl having 1-4 C atoms, $-CH_2CH_2-CH_2-NH_2$ and $-(CH_2)_b-X$, *b* = 1-12.

3,954,791

ANTHELMINTICALLY ACTIVE 2-CARBALKOXY-AMINO-BENZIMIDAZOLE-5(6)-PHENYL ETHERS

Heinz Loewe, Kelkheim, Taunus; Josef Urbanietz, Schwalbach, Taunus; Reinhard Kirsch, and Dieter Duwel, both of Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

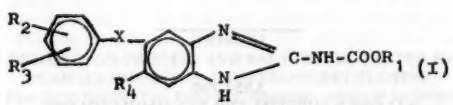
Filed Dec. 26, 1972, Ser. No. 318,271

Claims priority, application Germany, Dec. 27, 1971, 2164690

Int. Cl.² C07D *235/32*

U.S. Cl. 260—309.2 **19 Claims**

1. A 2-Carbalkoxy-amino-benzimidazole-5(6)- phenyl ether of the formula (I)



(I)

in which R_1 represents alkyl of 1 to 4 carbon atoms, R_2 and R_3 represent, independently of each other, hydrogen, hydroxyl, alkoxy of 1 to 4 carbon atoms, halogen, trifluoromethyl, alkyl of 1 to 4 carbon atoms or carbalkoxy of 1 to 4 carbon atoms in the alkoxy group, R_4 represents hydrogen or chlorine and X represents oxygen or sulfur.

3,954,792

2-DIALKYLAMINO-5-TRIFLUOROMETHYL-7-NITROBENZIMIDAZOLES

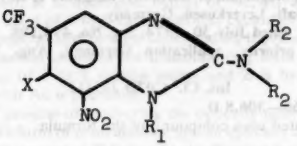
Kelvin Kei-Wei Shen, Fountain Valley, Calif., assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Mar. 6, 1975, Ser. No. 556,076

Int. Cl.² C07D *235/30*

U.S. Cl. 260—309.2 **8 Claims**

1. A compound of the formula



in which R_1 represents hydrogen, lower alkyl, halo-substituted lower alkyl, lower cycloalkyl, or lower alkoxy-substituted lower alkyl; R_2 represents lower alkyl, and X represents halo or lower alkoxy.

3,954,793

1-(2-PROPYNYL)-1 H-INDAZOLE COMPOUNDS

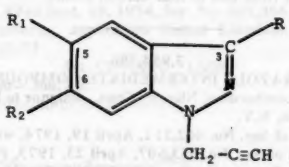
Douglas J. Hennessy, 47 Grayson Place, Teaneck, N.J. 07666

Division of Ser. No. 164,411, July 20, 1971, abandoned. This application Sept. 13, 1973, Ser. No. 397,063

Int. Cl.² C07D *231/56*; A01N *9/22*

U.S. Cl. 260—310 C **7 Claims**

1. A 1-(2-propynyl)-1 H-indazole compound represented by the formula



wherein R represents hydrogen or halogen other than iodine, R_1 represents hydrogen or nitro, and R_2 represents hydrogen, nitro or halogen other than iodine.

3,954,794

HETEROCYCLIC COMPOUNDS

Marcel Plattier, Antibes; Bernard Shimizu, and Paul Jose Teisseire, both of Grasse, all of France, assignors to Societe Anonyme Roure Bertrand Dupont, Paris, France

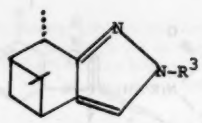
Filed Mar. 18, 1974, Ser. No. 452,349

Claims priority, application Switzerland, Mar. 22, 1973, 4301/73

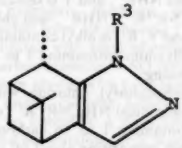
Int. Cl.² C07D *231/54*

U.S. Cl. 260—310 R **4 Claims**

1. A compound of the formulae II or III



II



III

wherein R^3 represents an alkyl group of from 1 to 5 carbon atoms.

3,954,795

PROCESS FOR PREPARING PIGMENTARY β-COPPER PHTHALOCYANINE

Julius Jackson, Westfield, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 2, 1975, Ser. No. 573,993

Int. Cl.² C09B *47/02*

U.S. Cl. 260—314.5 **7 Claims**

1. Improved process for preparing copper phthalocyanine by viscous salt milling a mixture of crude copper phthalocyanine, water soluble inorganic salt, and an organic conditioning agent selected from the group consisting of polyols, ethers of polyols, ester of polyols, chlorinated derivatives of said polyols, and mixtures of said polyols, ethers, esters, and said chlorinated derivatives, said organic conditioning agent being present in an amount from 3% to 25% by weight, based on the total weight of the solids in said mixture, and recovering the pigment,

wherein the improvement for producing pigmentary copper phthalocyanine in the β-phase and for effecting the viscous salt milling at low energy input comprises adding $FeCl_3$ to said mixture prior to milling.

3,954,796

TETRA-(ALKYLSULPHAMOYL)-COPPER PHTHALOCYANINES AND A PROCESS FOR THEIR MANUFACTURE

Werner Kuster, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

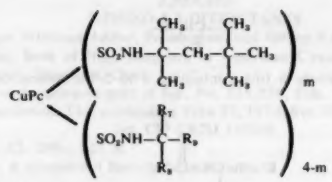
Filed July 10, 1974, Ser. No. 487,106

Claims priority, application Switzerland, July 19, 1973, 10582/73

Int. Cl.² C09B *47/04*

U.S. Cl. 260—314.5 **4 Claims**

1. A tetra-(alkylsulphamoyl)-copper phthalocyanine of the formula



wherein CuPc denotes a copper phthalocyanine radical where each benzene ring in said radical contains one sulphonamide group; R_7, R_8 and R_9 denote alkyl radicals with a total of 11–13 C atoms and *m* denotes the number 1–3.

3,954,797

PROCESS FOR PREPARING AZASULFONIUM HALIDE SALTS

Paul G. Gassman, and Gordon D. Gruetzmacher, both of Columbus, Ohio, assignors to Chromalloy American Corporation, New York, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,050

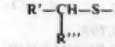
Int. Cl.² C07D *209/46, 209/08*

U.S. Cl. 260—319.1 **18 Claims**

1. In a process for preparing an ortho-alkylated aniline or an ortho-alkylated aminopyridine, an indole or a 2-oxindole, said process involving the use of an azasulfonium halide salt derivative of an organic sulfide compound and an N-halo-aniline or an N-halo-aminopyridine in one of the steps of said process, the azasulfonium halide salt in said process thereafter being reacted with

1. a base to form an ortho-hydrocarbon-S-hydrocarbon aromatic amine thio-ether if an organic thio-ether is used in preparing the azasulfonium halide salt, which is reduced to an ortho-hydrocarbon aromatic amine, this yielding ortho-alkylated anilines and ortho-alkylated aminopyridines; or
2. A base to form a thio-ether-substituted indole or thio-ether-substituted indolenine if a β-carbonyl sulfide or α-alkyl-β-carbonyl sulfide is used, respectively, in preparing the azasulfonium halide salt, or with a base and then with an acid if a β-carbonyl sulfide acetal or ketal is used in preparing the azasulfonium halide salt, to form the thio-ether-substituted indole or thio-ether-substituted indolenine, which can be reduced to remove the thio-ether group from the indole or indolenine, this yielding indoles, or
3. a base to form an ortho-[1-(thio-ether) (hydro-carbonoxycarbonyl)alkyl]aniline or an ortho-[1-(thio-ether)-(aminocarbonyl)alkyl]aniline if a beta-thio-carboxylic ester or amide is used in preparing the azasulfonium halide salt, and then treating the ortho-substituted aniline with an acid to form a 3-thio-ether-2-oxindole compound, which can be reduced to remove the thio-ether group from the 2-oxindole, the improvement which comprises

a. reacting a halogen selected from the group consisting of chlorine and bromine with an organic sulfide compound selected from the group consisting of:

I 

wherein

R′ is hydrogen, lower alkyl or phenyl;

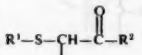
R″, taken separately, is lower alkyl or phenyl;

R‴, taken separately, is hydrogen, lower alkyl or phenyl; and

R″ and R‴, when taken together with the

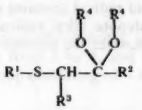
moiety, denote a ring containing 3 to 5 methylene carbon atoms,

II(a)



and

II(b)



wherein

R^1 is lower alkyl or phenyl;

R^2 is hydrogen, lower alkyl or phenyl;

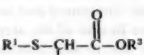
R^3 is hydrogen, lower alkyl, phenyl or benzyl;

R^2 can be attached to R^3 as part of a cyclic ring system containing 5 to 8 carbon atoms;

each R^4 is lower alkyl or the two R^4 radicals are taken together with the

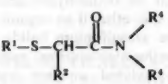
moiety to complete a cyclic ketal or acetal having three to four carbon atoms in the ring;

III(a)



and

III(b)



wherein

R^1 is lower alkyl, phenyl or benzyl;

R^2 is hydrogen, lower alkyl, phenyl or benzyl;

R^3 is lower alkyl, phenyl or benzyl;

each R^4 is hydrogen or lower alkyl, or the two R^4 groups are taken together with the nitrogen to form a ring containing four to five methylene carbon atoms and up to one ring oxygen atom; to form a halogen:sulfur compound complex, and

b. reacting an aniline or aminopyridine, having a free unsubstituted position on the aromatic ring ortho to the amino group, with the halogen:sulfur compound complex from step (*a*) to form the azasulfonium halide intermediate.

3,954,798

PROCESS FOR PREPARING PHOSPHOROTRIAMIDOTHIOATES

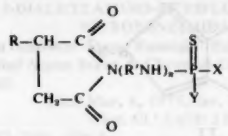
Hugh E. Romine, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Aug. 19, 1974, Ser. No. 498,345

Int. Cl.² C07D 207/12

U.S. Cl. 260—326.5 A **9 Claims**

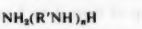
1. A process for preparing compounds represented by the formula



wherein R is alkenyl containing about 10 to about 100 carbon atoms; R′ is alkylene containing 1 to about 5 carbon atoms; *n* is an integer of 1 to 4; X is selected from the group consisting of NH_2, NR″R‴, and NHR‴, and Y is selected from the group consisting of NH_2, NR″R‴, NHR‴, and chloride or bromide ion, wherein in X and Y, R″ is alkyl containing 1 to 16 carbon atos or alkylene polyamino containing 1 to 20 carbon atoms, said process comprising:

a. reacting thiophosphoryl chloride with a monoamine which yields the radical NH_2, NR″R‴, or NHR‴ wherein R″ is alkyl containing 1 to 16 carbon atoms to give a reaction product comprising about 60 to about 100 mole percent phosphorochloridodiamidothioate and about 0 to about 40 mole percent phosphoroamidodichloridothioate,

b. reacting the reaction product of step (a) with an alkylene polyamine to give a phosphorotriamidothioate, said alkylene polyamine being represented by the formula



wherein R′ is alkenyl containing 1 to 5 carbon atoms and *n* is an integer of 1 to 4;

c. reacting the phosphorotriamidothioate of step (b) with an alkenyl succinic anhydride or an alkenyl succinic acid, wherein the alkenyl contains about 10 to about 100 carbon atoms; and

d. treating the reaction product of step (c) with a basic material, selected from the group consisting of metal oxide, amine and metal alkoxide, to give the desired product, said process being characterized further in that:

A. step (a) is conducted under the following conditions:

i. the amount of thiophosphoryl cloride to monoamine, on a molar basis, is in the range of about 1.0 to about 5.0, and

ii. the temperature is in the range of about 0° to about 110°C.;

B. in step (b) the amount of reaction product of step (a) to amount of polyalkylene amine, on a molar basis, is in the range of 1:0.5 to 1:10; and

C. in step (c) the amount of phosphorotriamidothioate to alkenyl succinic anhydride, on a molar basis, is about 1:0.5 to about 1:2.5.

3,954,799

PROTONATED INDOLE PHTHALIDES AND NAPHTHALIDES

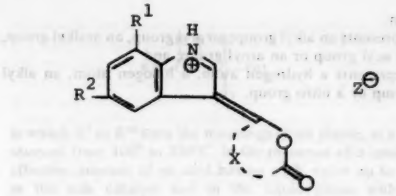
Alan L. Borror, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 108,662, Jan. 21, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 393,798

Int. Cl.² C07D 209/12

U.S. Cl. 260—326.12 R **12 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, methoxy, carboxy, $-NHSO_2R$ wherein R is selected from alkyl having 1 to 18 carbon atoms and phenyl substituted with alkyl wherein said alkyl substituent has 1 to 18 carbon atoms or $-SO_2NHR$ wherein R has the same meaning given above; R^2 is hydrogen, alkoxy containing 1 to 12 carbon atoms, carboxy or cyano; X represents the atoms necessary to complete a ring-closing moiety selected from phthalide and naphthalide; an Z is an anion derived from a protic acid having a pKa less than 4 selected from toluene-para-sulfonic acid and sulfuric acid, at least one of said R^1 and R^2 being hydrogen.

3,954,800

OXIDATION OF THIOLS TO DISULFIDES

Orville G. Lowe, 3815 Los Feliz Blvd., Los Angeles, Calif. 90027

Filed Dec. 26, 1973, Ser. No. 427,470

Int. Cl.² C07D *339/08*

U.S. Cl. 260—327 R **23 Claims**

1. A process for the formation of a disulfide through oxidation of a thiol, said process comprising:

reacting a thiol having the formula R-SH or

with a sulfoxide having the formula

in the presence of a catalytically effective amount of a halogen or hydrogen halide catalyst in which the halogen or hydrogen halide catalyst is iodine, bromine, chlorine, hydrogen iodide, hydrogen bromide, hydrogen chloride, or mixtures thereof,

with R being an alkyl group containing from 1 to about 20 carbon atoms, a cycloaliphatic group containing from 3 to about 20 carbon atoms, an aralkyl group containing from 5 to about 20 carbon atoms, or a mixture of such groups,

R′ and R″ being lower alkyl groups which may be the same or different and may be bonded together to form a ring structure,

said reaction being carried out at a temperature of less than about 100°C. to prevent oxidation of the disulfide product to a sulfonic acid, and

discontinuing the reaction when the oxidation of said thiol to a disulfide is substantially completed.

3,954,801

2-IMINO-1,3-DITHIETANES

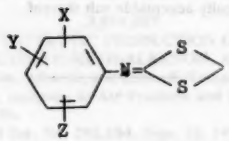
Roger Williams Addor, Pennington, and Sidney Kantor, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 225,278, Feb. 10, 1972, abandoned. This application June 27, 1974, Ser. No. 483,485

Int. Cl.² C07D *339/06*

U.S. Cl. 260—327 M **5 Claims**

1. A compound having the structure:



wherein the substituents X, Y and Z are selected from the groups consisting of 2-CH_3, 4-Cl; 2-CH_3, 4-Br; 2-CH_3; 2,5-$(CH_3)_2$; 2,4,5-$(CH_3)_3$; 2-CH_3, 3-Cl; 2,4-$(CH_3)_2$; 2,4-Cl_2; 2-OCH_3; 2-Cl; 2,6-$(C_2H_5)_2$; 2-Cl, 4-CH_3; and 2-Br, 4-CH_3.

3,954,802

SUBSTITUTED-UREIDO DERIVATIVES OF PENAM 3-CARBOXYLIC ACID AND CEPHEM 4-CARBOXYLIC ACID

Karoly Kocsis, Basel; Bruno Fechtig, Reinach, and Hans Bickel, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

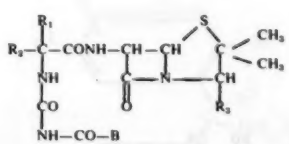
Filed Mar. 22, 1973, Ser. No. 344,004

Claims priority, application Switzerland, Mar. 29, 1972, 4732/72

Int. Cl.² C07D *499/64*, *501/60*

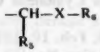
U.S. Cl. 260—239.1 **12 Claims**

1. A compound of the formula



wherein R_3 denotes a free carboxyl group and, if R_1 and R_2 are separate, R_1 is hydrogen and R_2 is phenyl, thienyl or furyl, and, if R_1 and R_2 are combined, they form together with the carbon

atom, cycloalkyl of 4 to 7 carbon atoms, and wherein B denotes a radical of the formula



wherein x represents carbonyloxy or sulphonyl, R_5 represents hydrogen, lower alkyl, phenyl, thienyl, furyl or pyridyl and R_6 represents (a) lower alkyl or lower alkyl mono substituted by halogen, lower alkoxy, phenoxy or lower alkanoloxy or (b) phenyl, naphthyl, benzyl, furyl, thienyl, furfuryl, thenyl, pyridyl, pyrazinyl or pyrimidyl or phenyl, naphthyl, benzyl, furyl, thienyl, furfuryl, thenyl, pyridyl, pyrazinyl or pyrimidyl mono substituted by lower alkyl, lower alkoxy, halogen or nitro, or a pharmaceutically acceptable salt thereof.

3,954,803

DILACTONE CHROMOGENIC COMPOUNDS AND PREPARATION THEREOF

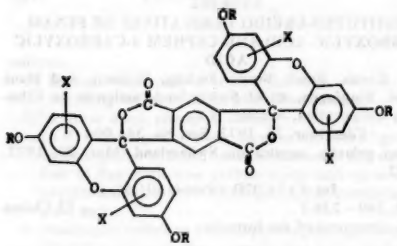
David N. Vincent, Glenview, and Cheng Hsiung Chang, Chicago, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 329,293, Feb. 5, 1973, Pat. No. 3,819,396. This application Jan. 2, 1974, Ser. No. 430,142

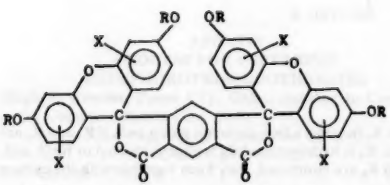
Int. Cl.[2] C07D *311/86*

U.S. Cl. 260—335 **21 Claims**

1. A chromogenous compound having a formula selected from the group consisting of



and



wherein:

R represents an alkyl group, an aryl group, an aralkyl group, an acyl group or an aroyl group; and

X represents a hydrogen atom, a halogen atom, an alkyl group or a nitro group.

3,954,804

PRODUCTION OF HIGH MOLECULAR WEIGHT UNSATURATED KETONES

Roman Fischer, Ludwigshafen, and Norbert Goetz, Bobenheim-Roxheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

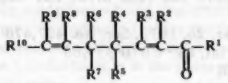
Filed Mar. 28, 1973, Ser. No. 345,504

Claims priority, application Germany, Apr. 8, 1972, 2216974

Int. Cl.[2] C07C *41/00, 45/00*

U.S. Cl. 260—340.7 **8 Claims**

1. A process for the production of high molecular weight unsaturated ketones of the formula



(I),

in which:

R^1 is aklyl of one to four carbon atoms, a cycloaliphatic hydrocarbon radical or phenyl;

R^1, R^4 and R^5 together may be alkylene which may bear alkyl as a substitute;

R^2, R^3, R^4, R^6, R^7 and R^8 are hydrogen or alkyl of one to four carbon atoms;

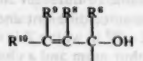
R^5 is hydrogen or a saturated or unsaturated, branched or unbranched aliphatic, cycloaliphatic or cycloaliphatic-aliphatic hydrocarbon radical of one to 12 carbon atoms, or together with R^4 may form alkylidene of one to twelve carbon atoms;

R^9 is alkyl of one to four carbon atoms; and

R^{10} is a saturated or unsaturated, branched or unbranched, aliphatic cycloaliphatic or cycloaliphatic-aliphatic hydrocarbon radical of one to 12 carbon atoms which may also contain other than hydrogen and carbon atoms only oxygen in the form of an ether, acetal or ester grouping, or unsubstituted or alkyl-substituted phenyl, and

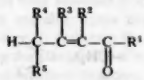
when R^{10} is unsubstituted or substituted phenyl R^9 may also denote hydrogen, which process comprises:

reacting an allyl alcohol of the formula



(II),

in which R^6 to R^{10} have the meanings given above, at a temperature of from 100° to 350°C. in the presence of a catalytically effective amount of an acid having a pK value up to about 7 as the sole catalyst and in the liquid phase with a α,β-unsaturated ketone of the formula



(III)

in which R^1 to R^5 have the meanings given above.

3,954,805

PROCESS FOR PREPARING ZEARALENE TYPE COMPOUNDS

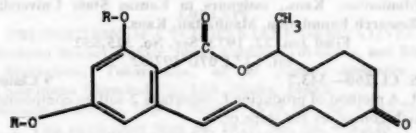
Frank Kavka, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Continuation of Ser. No. 476,888, June 6, 1974, abandoned. This application Mar. 25, 1975, Ser. No. 561,898

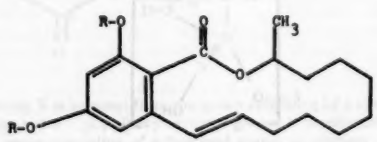
Int. Cl.² C07D *313/00*

U.S. Cl. 260—343.2 F **14 Claims**

1. A process for preparing a zearalene type compound which comprises treating a zearalenone compound having the structural formula



wherein R is selected from the group consisting of hydrogen, lower alkyl, monocyclic aryl and lower alkanoyl, in a solvent selected from the group consisting of dioxane, ethyl acetate, ethyl ether, tetrahydrofurane, acetic anhydride and propionic anhydride, under keto-reducing conditions in the presence of keto-reducing amounts of zinc and hydrogen halide selected from the group consisting of hydrogen fluoride, hydrogen bromide, and hydrogen chloride, to convert the keto group of the zearalenane compound to a methylene group to obtain a zearalene compound having the structural formula



wherein R has the same meaning set forth above.

3,954,806

DL-STRIGOL INTERMEDIATES

Charles J. Sih, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 450,950, March 13, 1974, Pat. No. 3,887,547. This application Dec. 13, 1974, Ser. No. 532,325

Int. Cl.² C07D *307/93*

U.S. Cl. 260—343.3 R **2 Claims**

1. (±) 1β,4β-dihydroxy-7,7-dimethyl-4,5,6,7-tetrahydroindane-2β-acetic acid γ-lactone.

3,954,807

CATALYTIC PRODUCTION OF POLYHALO-KETO-ALKENOIC ACIDS

William A. Erby, Alburtis, and James F. Tompkins, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 292,384, Sept. 26, 1972, Pat. No. 3,842,126, which is a continuation of Ser. No. 723,283, April 22, 1968, abandoned. This application Aug. 19, 1974, Ser. No. 498,800

Int. Cl.² C07D *307/34*

U.S. Cl. 260—343.6 **3 Claims**

1. A method of producing 2,3,4,5,5,5-hexachloro-2-pentenoyl-4-lactone comprising: reacting chlorine gas with levulinic acid at liquid reactant temperatures between 155°C. and 210°C. in the presence of a catalytic amount of iron cation, said chlorine gas being introduced at a rate such that the heat of reaction will not cause the reaction temperature to exceed said limit, thereby effecting both addition of chlorine to and partial dehydrogenation of said acid molecule.

3,954,808

METHYLENE BIS-PHENOL ALKANOIC ACID COMPOUNDS

John Scotchford Elliott; Bryan Terence Davis, and Richard Martin Howlett, all of Bracknell, England, assignors to Edwin Cooper & Company Limited, Bracknell, England

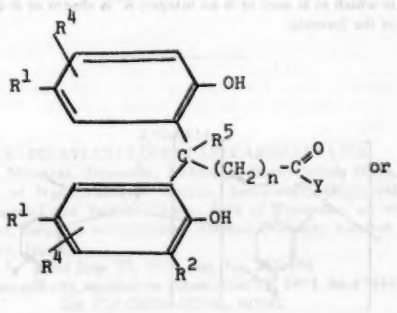
Filed Nov. 1, 1973, Ser. No. 412,027

Claims priority, application United Kingdom, Nov. 2, 1972, 50642/72

Int. Cl.² C07D *307/78*; **C07C** *63/52*; **C07D** *311/02*

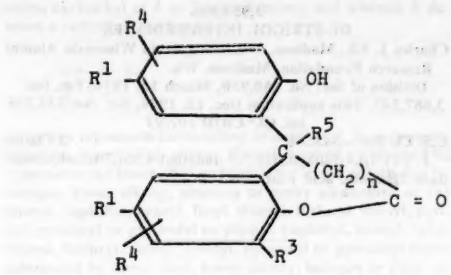
U.S. Cl. 260—343.2 R **7 Claims**

1. A compound having the general formula:



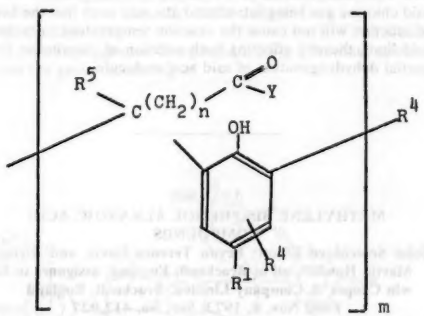
or

(A)

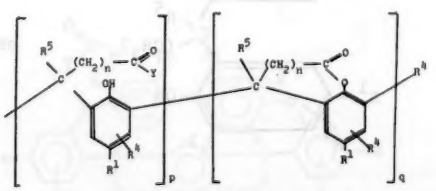


(B)

wherein each R^1 is the same or different and is an alkyl group containing at least 8 carbon atoms; R^2 is absent or is a group of the formula:

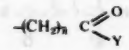


in which m is zero or is an integer; R^3 is absent or is a group of the formula:



(C)

in which *p* and *q* are the same or different and are zero or are integers; each R^4 is the same or different and is absent or is a group of the formula —Z—R^6 in which Z is selected from the group consisting of a sulphur atom and a chain of at least two sulphur atoms or is absent and R^6 is selected from the group consisting of an alkyl group and hydroxy-substituted monocyclic hydrocarbon aryl, aralkyl and alkaryl groups; each R^5 is the same or different and is selected from the group consisting of a hydrogen atom, a methyl group and a group of formula



each *n* is the same or different and is zero or an integer of from 1 to 2; and each Y is the same or different and is selected from the group consisting of a hydroxyl group and an alkoxy group.

3,954,809

PREPARATION OF L-ASCORBATE 2-SULFATE FROM L-ASCORBIC ACID

Charles W. Deyoe; Paul A. Seib, and R. Carl Hoseney, all of Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

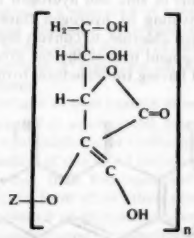
Filed Jan. 22, 1973, Ser. No. 325,652

Int. Cl.[2] C07D *307/62*

U.S. Cl. 260—343.7 **9 Claims**

1. A method of producing L-ascorbate 2-sulfate compounds which comprises the steps of:

reacting in a non-interfering aqueous solvent which does not substantially hinder the desired sulfation reaction a compound selected from the group consisting of L-ascorbic acid and salts thereof of the formula



where Z is selected from the group consisting of hydrogen, the alkali metals, the alkaline earth metals and tertiary

amines, and n represents the valence of Z, with a sulfur trioxide complex of the formula

where A is selected from the group consisting of trimethylamine, triethylamine, tributylamine and N,N-dimethylbenzylamine; and

adding sufficient base selected from the group consisting of the inorganic metallic bases and tertiary amines to the reaction mixture to maintain the latter at a basic pH level for increasing the selectivity of sulfation at the 2-hydroxyl of said first-mentioned reactant.

3,954,810
PROCESS FOR THE PREPARATION OF 4-BROMONAPHTHALIC ACID ANHYDRIDE

Walter Deucker, Neuenhain, Taunus, and Helmut Tröster, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 16, 1974, Ser. No. 433,795
Int. Cl.² C07D *311/02*
U.S. Cl. 260—345.2 **6 Claims**

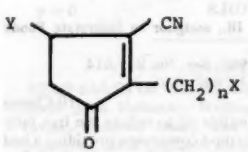
1. In a process for preparing 4-bromo-naphthalic acid anhydride by reacting bromine with naphthalic acid in aqueous solution and isolating the product by acidifying the reaction mixture, the improvement which comprises gradually adding bromine to an aqueous solution of an alkali metal salt of naphthalic acid while maintaining the pH of said solution between 6.8 and 9 and while maintaining the temperature of said solution between 0° and 30°C., 0.55 to 0.65 mol of bromine being added per mol of naphthalic acid, and thereafter adding to said solution either about one mol of chlorine gas or an equivalent amount of a solution of sodium or potassium hypochlorite per mol of naphthalic acid until the degree of bromination required has been reached and while maintaining said pH and temperature, whereby a product having a chlorine content below 0.3 percent is obtained.

3,954,811
PRODUCTION OF CYCLOPENTANE DERIVATIVES

Masanao Matsui, Tokyo; Junki Katsube, Toyonaka, and Eichi Murayama, Tokarazuka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Division of Ser. No. 70,877, Sept. 9, 1970, Pat. No. 3,832,380.
This application May 30, 1974, Ser. No. 474,628
Claims priority, application Japan, Sept. 9, 1969, 44-71785; Nov. 18, 1969, 44-92746; Nov. 18, 1969, 44-92747; Jan. 31, 1970, 45-8670
Int. Cl.² C07D *309/00*; C07C *120/00, 120/06, 121/46*
U.S. Cl. 260—345.7 **4 Claims**

1. A 3-cyanocyclopentenone derivative having the formula



(IV)

wherein X is selected from the group consisting of a carboxyl group and a C_1-C_4 alkoxy carbonyl group, Y is selected from the group consisting of a hydroxyl group, an acetoxy group and a tetrahydropyranyloxy group and *n* is an integer of 5 to 7.

3,954,812
POLYBUTENE COMPOSITION CONTAINING HALOGEN-CONTAINING ADDITIVES AND USE THEREOF

Imre Puskas, Glen Ellyn, and John A. Cengel, Wheaton, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed May 10, 1973, Ser. No. 358,911
Int. Cl.² C07D *307/36*
U.S. Cl. 260—346.8 R **3 Claims**

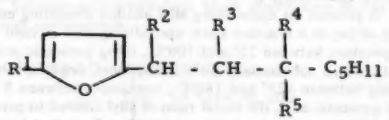
1. The method of preparing polybutenylsuccinic anhydride which comprises reacting at a temperature in the range of 150° to 300°C from 0.8 to 5.0 moles maleic anhydride per mole of polybutene in the composition consisting essentially of the butylene polymer having a $\overline{M}_n$ in the range of about 300 to about 3000 and 5 to 200 ppm based on the weight of such polymer of acetyl bromide, bromacetylbromide, benzoylbromide, or N-bromosuccinimide.

3,954,813
FURANE DERIVATIVES AND PRODUCTION THEREOF

Poul Nedenskov, Birkerod, and Karol Alster, Farum, both of Denmark, assignors to Aktieselskabet Grindstedvaerket, Arhus, Denmark

Filed June 19, 1974, Ser. No. 480,721
Int. Cl.² C07D *307/54*
U.S. Cl. 260—347.3 **7 Claims**

1. A 2,5-Furane derivative of the formula



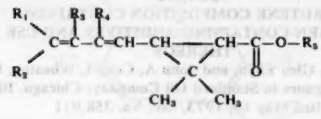
wherein R^1 represents a group of the formula $ROOC-(CH_2)_7$, wherein R represents hydrogen or a lower alkyl group, each of R^2 and R^3 represents hydrogen, or R^2 and R^3 together represent a further bond between the carbon atoms, and each of R^4 and R^5 represents hydrogen, hydroxy or a lower alkyl group, or R^4 and R^5 together represent an oxygen atom.

3,954,814
ALKADIENYLCYCLOPROPANECARBOXYLATES

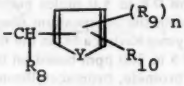
Toshio Mizutani, Toyonaka; Nobushige Itaya; Nobuo Ohno, both of Ikeda; Takashi Matsuo, Amagasaki; Shigeyoshi Kitamura, and Yositosi Okuno, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed June 23, 1972, Ser. No. 265,494
Claims priority, application Japan, June 28, 1971, 46-47444
Int. Cl.² C07D *307/44, 307/42*
U.S. Cl. 260—347.4 **4 Claims**

1. A compound of the formula,



wherein R_1, R_2, R_3 and R_4 are respectively hydrogen atom or methyl, R_5 is



wherein R_8 is a hydrogen atom, ethynyl or cyano, R_9 is a hydrogen atom, a halogen atom or methyl, R_{10} is a halogen atom, methyl, allyl, propargyl, benzyl, thenyl, furylmethyl, phenoxy, methyl-, methoxy- or chlorine-substituted phenoxy or phenylthio, or R_9 and R_{10} are bonded at the ends to form trimethylene, tetramethylene or $-CH_2-O-CH_2-CH_2-$, Y is oxygen atom, n is 1 or 2.

3,954,815
GLYCIDOL AND GLYCEROL PROCESS

Warren C. Fisher, Darien, Conn.; Seymour M. Linder, Baltimore, Md.; Ralph L. Pelley, Linthicum Heights, Md., and Hsiang-Peng Liao, Glen Burnie, all of Md., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 519,841, Jan. 11, 1966, abandoned. This application May 22, 1970, Ser. No. 41,675

Int. Cl.² C07D *301/14*

U.S. Cl. 260—348.5 L **5 Claims**

1. A process for epoxidizing allyl alcohol consisting essentially of (a) in a reaction zone, epoxidizing allyl alcohol at a temperature between 25° and 100°C., using peracetic acid in solution in a substantially anhydrous, inert, organic solvent boiling between 125° and 180°C., containing between 5 and 40% peracetic acid, the molar ratio of allyl alcohol to peracetic acid being more than one and less than 5, until at least 70 to about 95% of the peracetic acid is reacted to produce a reaction mixture containing glycidol, allyl alcohol, peracetic acid, co-product acetic acid and said solvent (b) subjecting the reaction mixture to continuous fractional distillation below 400 mm. of Hg., to rapidly and continuously separate (1) a mixture of co-product acetic acid with allyl alcohol and surviving peracetic acid from (2) a mixture of glycidol and said solvent, said mixture (1) being more volatile in said distillation than said mixture (2).

3,954,816
PHOTOSENSITIVE MATERIAL COMPRISING POLYACETYLENIC AMINE SALTS

Melvin S. Bloom, Rochester, and Sally S. Fico, Bergen, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 315,249, Dec. 14, 1972, Pat. No. 3,844,791, which is a division of Ser. No. 153,059, June 14, 1971, Pat. No. 3,743,505. This application Feb. 6, 1974, Ser. No. 440,229

Int. Cl.² C07C *87/30, 87/68, 91/26*

U.S. Cl. 260—404.5 **7 Claims**

1. Radiation-sensitive crystalline polyacetylenic amine salts having the structural formula:

$$D-(CH_2)_x(C\equiv C)_n(CH_2)_y-COO\ominus A\oplus$$

wherein:

n is an integer greater than 1;

x and *y* are each an integer from 0 to 10;

A is $NRR^1R^2R^3$ wherein R, R^1, R^2 and R^3 are H, alkyl of from 1 to 10 carbon atoms, aryl or substituted alkyl having substituents chosen from the group consisting of hydroxy, amino, carboxy and methoxy substituents;

D is selected from the group consisting of $CONHR^5$, $CONHNHR^6$, and R^7NHCOO radicals, wherein

R^5 is an alkyl or substituted alkyl of from 3 to 8 carbon atoms in which the substituents are chosen from the group consisting of hydroxy, amino, and methoxy substituents,

R^6 is alkyl or phenyl, and

R^7 is an alkyl of from 1 to 8 carbons or phenyl.

3,954,817
PROCESS FOR THE MANUFACTURE OF PERFLUOROALKYLMETHYLENE-CARBOXYLIC ACIDS

Horst Jäger, Bettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 15, 1974, Ser. No. 442,951

Claims priority, application Switzerland, Mar. 5, 1973, 3186/73

Int. Cl.² C07C *51/16*

U.S. Cl. 260—408 **12 Claims**

1. A process for the manufacture of perfluoroalkylmethylenecarboxylic acids of the formula

$$R_f(CH_2CF_2)_{m-1}-CH_2-COOH$$

wherein R_f is an unbranched or a branched perfluoroalkyl radical with 3 to 14 carbon atoms and *m* is 1 to 3, which comprises the steps of, (a) reacting perfluoroalkyl iodides of the formula

$$R_f-(CH_2CF_2)_m-I$$

with nitric acid of 90 to 98% strength in a molar ratio of iodides to nitric acid of 1:1–10, at temperatures of 50° to 150°C and a reaction time of 1 to 20 hours and (b) recovering said perfluoroalkylmethylenecarboxylic acids from the reaction mixture.

3,954,818
SYNTHESIS OF NON-4-EN-6-YNOIC ACID ESTER

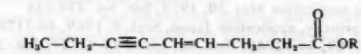
Jeffery N. Labovitz, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Nov. 25, 1974, Ser. No. 526,496

Int. Cl.² C11C *3/02*

U.S. Cl. 260—410.9 R **2 Claims**

1. A compound having the formula:



wherein R is methyl or ethyl.

3,954,819
METHOD AND COMPOSITION FOR TREATING EDIBLE OILS

Robert L. Husch, Chicago, Ill., assignor to Interstate Foods Corporation, Chicago, Ill.

Filed Mar. 28, 1969, Ser. No. 811,614

Int. Cl.² C09F *5/10*

U.S. Cl. 260—428 **10 Claims**

1. A method for treating edible oil to reduce the free fatty acids content therein, said method comprising providing a bed containing a molecular sieve capable of removing said free fatty acids from said oil, and passing said oil through said bed to thereby reduce the free fatty acids contained therein.

6. A continuous method for treating crude edible oil to reduce the free fatty acids content therein so as to produce edible oil useful in cooking operations for the preparation of foods, said method comprising: providing at least two reactors

each containing a Type X molecular sieve capable of removing said free fatty acids from said oil; passing said oil through the first of said reactors to contact the oil with said molecular sieve therein while simultaneously regenerating the spent molecular sieve in another of said reactors; and passing said crude oil through a reactor containing the regenerated molecular sieve after said molecular sieve in said first reactor has become saturated with respect to said free fatty acids so that said first reactor may be regenerated.

3,954,820

PREPARATION OF HYDROCARBYL METAL HALIDES

Mannat C. Menon, University Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Feb. 19, 1974, Ser. No. 443,704
Int. Cl.² C07F 7/22
U.S. Cl. 260—429.7 13 Claims

1. A catalytic process for preparing a hydrocarbyl substituted tin halide from tin in its metallic state and a hydrocarbyl halide, comprising: catalytically reacting the metallic tin and hydrocarbyl halide at a reaction temperature in a liquid organic heat-transfer medium in the presence of a catalytic amount of a catalyst consisting essentially of a complex formed between said hydrocarbyl substituted tin halide and a dihydrocarbyl substituted sulfoxide, said liquid medium being a solvent for the hydrocarbyl halide and complex, said hydrocarbyl substituents in said halide and said sulfoxide being the same or different and in all cases being selected from the group consisting of alkyl, isoalkyl, or cycloalkyl, each up to 12 carbon atoms, and alkenyl, isoalkenyl, and cycloalkenyl, each up to 12 carbon atoms.

3,954,821

CARBON DIOXIDE COMPLEXES OF RH, IR, NI, PD, AND PT

Thomas Herskovitz, and George William Parshall, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 30, 1975, Ser. No. 592,074
Int. Cl.² C07F 15/00, 15/04
U.S. Cl. 260—429 R 16 Claims

1. A carbon dioxide/metal complex of the formula

$ML_m(CO_2)_nX_p$, wherein:

M is Rh, Ir, Ni, Pd, or Pt;

L is one equivalent of an acyclic tertiary alkyl phosphine or arsine ligand in which each alkyl group is saturated and may contain up to 18 carbons;

X is one equivalent of an anion; and

when M is Rh or Ir

m is 3 to 4

n is 1 or 2

p is 1, and

$m + n$ does not exceed 5;

when M is Ni, Pd or Pt

m is 3,

n is 1, and

p is 0.

3,954,822

LEAD SALTS OF DI- OR TRI-NITRORESORCINOL

Kenneth John Holloway, Welling; George William Charles Taylor, Waltham Abbey, and Arwyn Theophilus Thomas, Orpington, all of England, assignors to Ministry of Defence, London, England

Filed Mar. 7, 1967, Ser. No. 621,367
Claims priority, application United Kingdom, Mar. 8, 1966, 10217/66
Int. Cl.² C07F 7/24
U.S. Cl. 260—435 A 4 Claims

1. A polybasic lead salt of a di- or a tri-nitro-substituted resorcinol containing 3, 4, 5 or 6 atoms of lead per aromatic nucleus.

3,954,823

INTERCONVERSION OF STEREOISOMERIC CYCLOORGANOSILOXANES

Cecil L. Frye, and David E. Spielvogel, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed June 2, 1975, Ser. No. 583,304
Int. Cl.² C07F 7/02, 7/08, 7/20
U.S. Cl. 260—448.2 E 17 Claims

1. A method of converting stereoisomeric cyclosiloxanes from one stereoisomer to another which comprises contacting a cyclosiloxane which is capable of forming cis and trans isomers with an anhydrous catalyst of the group MX_n where X is chlorine or bromine, M is zinc, iron or aluminum and n is the valence of the metal or an aryl phosphonium halide in a solvent of the group organic nitro compounds and aryl phosphate esters under conditions where such conversion will take place without appreciable distribution of the siloxane structure.

2. The method of claim 1 which is carried out by feeding the undesired isomer to a heating zone, selectively removing the desired isomer from the heating zone whereby the undesired isomer is substantially completely converted to the desired isomer.

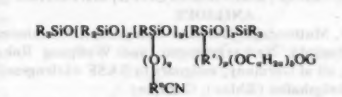
3,954,824

ORGANOSILICONE POLYMERS AND POLYESTER URETHANE FOAM PRODUCED THEREWITH

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,510
Int. Cl.² C07F 7/08, 7/10, 7/18
U.S. Cl. 260—448.8 R 36 Claims

1. Siloxane-polyoxyalkylene block copolymers having the average composition,



wherein: R is alkyl having from 1 to 10 carbon atoms; R° is bivalent alkylene of from 2 to 12 carbon atoms; R′ comprises a bivalent alkylene group of from 2 to 6 carbon atoms a carbon atom of which is bonded to silicon; a has a value from 2 to 4 provided at least 75 weight percent of the polyoxyalkylene content of the copolymers is constituted of oxyethylene; G is R°°—, R°°NHC(O)— or R°°C(O)— where R°° is a monovalent hydrocarbon group of 1 to 12 carbon atoms; b has an average value from about 3 to about 30; q is zero or 1; p is zero or 1; x is zero or a positive number having an average value up to about 20, y has an average value from about 2 to about 20 and z has an average value from about 2 to about 30, provided the average weight of the copolymers attributable to the polyoxyalkylene blocks, $-(R')_p(OC_aH_{2a})_bOG$, is from about 50 to about 85 weight percent.

3,954,825

BIURET POLYISOCYANATES

William Joseph Touhey, Jr., Wilmington, and Harry Walter Wolfe, Jr., Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 387,030, Aug. 9, 1973, abandoned. This application Apr. 5, 1974, Ser. No. 458,183
Int. Cl.² C07C 119/042
U.S. Cl. 260—453 AB 4 Claims

1. In a process for preparing a biuret polyisocyanate by reacting a polyamine and an excess of a polyisocyanate at a temperature of about 80-200°C. in the absence of a solvent,

the improvement comprising employing a mixture of polyamines containing hindered and unhindered amine groups prepared by condensing aniline, 2-chloroaniline, and formaldehyde; the mole ratio of 2-chloroaniline to aniline being 2:1 to 4:1 and the total moles of amine per mole of formaldehyde being 1.3 to 2.0.

3,954,826

PROCESS FOR PRODUCING α-SULFOPHENYLACETIC ACID DERIVATIVES

Keiichi Sugimoto, Kawani; Koji Nishijima, Osaka; Hiroshi Akimoto, Hyogo; Tadashi Hanaoka, Osaka, and Nobuharu Kakeya, Kawani, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed July 9, 1974, Ser. No. 486,835

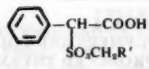
Claims priority, application Japan, July 9, 1973, 48-77262; July 13, 1973, 48-79606; July 30, 1973, 48-85661

Int. Cl.² C07C *143/68*

U.S. Cl. 260—456 R **7 Claims**

1. α-Isobutylsulfophenylacetic acid.

2. An α-sulfophenylacetic acid derivative of the general formula:



wherein R′ is a branched alkyl group of 4 to 14 carbon atoms.

3,954,827

SUBSTITUTED O-[AMINOSULFONYL]-GLYCOLIC ANILIDES

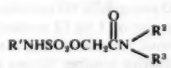
Adolf Fischer, Mutterstadt; Gerhard Hamprecht, Mannheim; Dietrich Mangold, Neckargemuena, and Wolfgang Rohr, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 321,548, Jan. 5, 1973, Pat. No. 3,870,740. This application Sept. 3, 1974, Ser. No. 502,741

Int. Cl.² C07C *143/68*

U.S. Cl. 260—456 A **3 Claims**

1. A substituted O-(aminosulfonyl)-glycolic glycolic anilide of the formula



where R′ denotes cyclopentyl or cyclohexyl, R^2 denotes phenyl, and R^3 denotes alkyl of 1 to 6 carbon atoms.

3,954,828

PERFLUOROALKANESULFONATE ESTER HERBICIDES

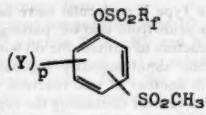
Tomas L. Fridinger, Woodbury, Minn., assignor to Tomas L. Fridinger, St. Paul, Minn.

Division of Ser. No. 336,956, March 1, 1973, Pat. No. 3,907,853, which is a continuation-in-part of Ser. No. 27,998, April 13, 1970, abandoned. This application May 8, 1975, Ser. No. 575,648

Int. Cl.² C07C *143/68*

U.S. Cl. 260—456 P **6 Claims**

1. A compound of the formula:



wherein R_f is CF_3 or C_2F_5, each Y independently is chlorine or an alkyl group having 1 or 2 carbon atoms and p is zero, 1 or 2.

3,954,829

HALOGENATED 4-TRIFLUOROMETHYL-4′-CYANO-DIPHENYL-ETHER COMPOUNDS

Lothar Rohe, Wuppertal; Jürgen Schramm, Dormagen; Erich Klauke, Odenthal-Hahnenberg; Ludwig Eue, and Robert Rudolf Schmidt, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

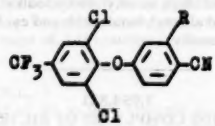
Filed June 26, 1974, Ser. No. 483,333

Claims priority, application Germany, July 3, 1973, 2333848

Int. Cl.² C07C *121/75*

U.S. Cl. 260—465 F **7 Claims**

1. Halogenated 4-trifluoromethyl-4′-cyano-diphenyl-ether compound of the formula



(I)

in which

R is hydrogen, halogen, alkyl of from 1 to 4 carbon atoms or alkoxy of from 1 to 4 carbon atoms.

3,954,830

YELLOW METHINE DYES FOR HYDROPHOBIC TEXTILE MATERIAL

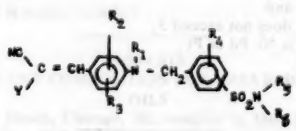
Edgar Earl Renfrew, Lock Haven, Pa., and Guido Ruggiero Lorenzo Genta, Snyder, N.Y., assignors to American Aniline Products, Inc., Paterson, N.J.

Division of Ser. No. 248,483, April 28, 1972, Pat. No. 3,858,259. This application Oct. 24, 1974, Ser. No. 517,746

Int. Cl.² C07C *121/78*

U.S. Cl. 260—465 D **9 Claims**

1. A dye of the formula:



wherein Y is a member selected from the group consisting of cyano, benzyl, carbamoyl, N-lower alkyl carbamoyl, N,N-dilower alkyl carbamoyl, N-phenylcarbamoyl, N-loweralkoxy phenylcarbamoyl, N-loweralkyl phenyl carbamoyl, N-halophenyl carbamoyl, lower carbalkoxy, lower cyanocarbalkoxy, phenyl sulfonyl, halophenyl sulfonyl, and lower alkylphenylsulfonyl; R_1 is a member selected from the group consisting of lower alkyl, hydroxy lower alkyl and cyano lower alkyl; R_2, R_3 and R_4 are members selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, chlorine and bromine, and R_5 and R_6 are members selected from the group consisting of hydrogen, lower alkyl, cyano lower alkyl

and hydroxy lower alkyl and taken collectively form a 5 or 6-membered ring structure containing an additional nitrogen or oxygen hetero atom.

3,954,831

DIMERIZATION PROCESS

Olav Torgeir Onsager, Suffern, N.Y., assignor to Halcon International, Inc., New York, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,295
Int. Cl.[2] C07C *120/00*
U.S. Cl. 260—465.8 D 9 Claims

1. A process for the dimerization of acrylonitrile to produce 2-methylene glutaronitrile which comprises reacting said acrylonitrile in the liquid phase at a temperature of 10° to 150°C. in the presence of a catalyst consisting essentially of (a) at least one metal compound of the formula $M(X)_n$ wherein M is Zn or Co, X is an anion of an aryl sulfonic acid or of a carboxylic acid containing at least two carbon atoms which is substituted by at least one of the groups, —F, —Cl, —Br, —I and —CN in the α-C-position relative to the acid group, and n is a number equal to the valence of the metal M divided by the number of acid equivalents of X; and (b) at least one nitrogen-containing Lewis Base which is (1) a tertiary monoamine of the formula

wherein R^1, R^2, and R^3 are the same or different and each is an alkyl, cycloalkyl, benzyl or aryl radical; or (2) a tertiary poly-functional amine which contains at least two Lewis Base nitrogen groups separated from each other by at least one carbon atom, and which are (a) N-disubstituted amino groups wherein each N-substituent is the same or different and is an alkyl, cycloalkyl, benzyl or aryl radical, or (b) N-heterocyclic groups containing 3 to 20 carbon atoms; or (3) a mono nitrogen-containing N-substituted heterocyclic amine containing 3 to 20 carbon atoms in the heterocyclic ring wherein the N-substituent is an alkyl, cycloalkyl, benzyl or aryl radical, wherein the Lewis Base/metal compound mole ratio is from 0.1:1 to 25:1, each radical, each sulfonic acid anion and each heterocyclic group or ring may be unsubstituted of substituted by non-reactive groups, each alkyl radical contains 1 to 20 carbon atoms and each aryl radical contains 6 to 20 carbon atoms.

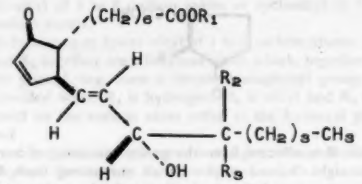
3,954,832

16-AND 16,16-METHYL AND ETHYL SUBSTITUTED PGA_1-TYPE COMPOUNDS

John E. Pike, and William P. Schneider, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 274,822, July 24, 1972, Pat. No. 3,813,433, and a continuation-in-part of Ser. No. 123,388, March 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 648,992, June 26, 1969, abandoned. This application Feb. 11, 1974, Ser. No. 441,648
Int. Cl.[2] C07C *61/38, 69/74*
U.S. Cl. 260—468 D 6 Claims

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, or a pharmacologically acceptable cation, and wherein R_2 and R_3 are methyl or ethyl.

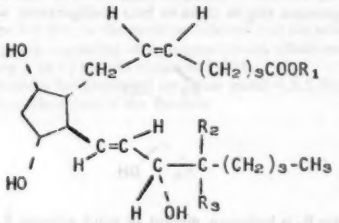
3,954,833

16,16-METHYL AND ETHYL SUBSTITUTED $PGF_{2\alpha}$ COMPOUNDS

Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 353,474, April 23, 1973, abandoned, which is a division of Ser. No. 133,342, April 12, 1971, abandoned. This application June 10, 1974, Ser. No. 477,600
Int. Cl.[2] C07C *61/38, 69/74*
U.S. Cl. 260—468 D 7 Claims

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein R_1 is hydrogen, alkyl of 1 to 8 carbon atoms, inclusive, or a pharmacologically acceptable cation, and wherein R_2 and R_3 are methyl or ethyl.

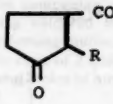
3,954,834

ALICYCLIC KETOESTERS AND PROCESS FOR THEIR MANUFACTURE

Amnon Mordechai Cohen, Amersfoort, Netherlands, assignor to Polak's Frutal Works N.V., Amersfoort, Netherlands

Continuation of Ser. No. 195,476, Nov. 3, 1971, abandoned. This application Nov. 26, 1973, Ser. No. 418,868
Claims priority, application United Kingdom, Nov. 4, 1970, 52388/70
Int. Cl.[2] C07C *69/74*
U.S. Cl. 260—468 K 11 Claims

1. New compounds having the structure:



wherein R is selected from the group consisting of branched and straight-chained alkyl radicals containing from 4 to 8 carbon atoms and the cycloalkyl radicals cyclopentyl and cyclohexyl, and R' represents an alkyl radical containing from 1 to 2 carbon atoms.

3,954,835

4,5-CIS-DIDEHYDRO-PGF$_1$ COMPOUNDS

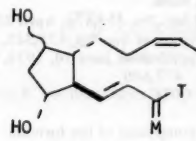
Bengt Samuelsson, Stockholm, Sweden, and Barney J. Magerlein, Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 248,005, April 27, 1972, abandoned. This application Feb. 7, 1974, Ser. No. 440,628

Int. Cl.^{2} C07C *69/74, 61/30*

U.S. Cl. 260—468 D **12 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein ~ indicates attachment of hydroxyl to the cyclopentane ring in alpha or beta configuration; wherein M is

or

wherein R_2 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and wherein T is 1-pentyl or cis 1-pent-2-enyl; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,954,836

N-METHYL-N-(BENZENE SULFONIC ACID METHYLAMIDE-N'-SULFENYL)-CARBAMIC ACID ESTERS

Peter Siegle, Cologne; Engelbert Kuhle, Bergisch-Gladbach; Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Overath-Steinenbrueck, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

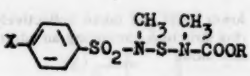
Filed Oct. 19, 1973, Ser. No. 408,253

Claims priority, application Germany, Nov. 7, 1972, 2254359

Int. Cl.^{2} C07C *143/78*

U.S. Cl. 260—470 **2 Claims**

1. A N-sulfenylated carbamate of the formula



in which

X is halogen, C_1–C_8 alkyl or hydrogen, and

R is a phenyl, 2-isopropoxyphenyl, 3,5-dimethyl-4-methylmercapto-phenyl, 3-methyl-4-dimethylaminophenyl, 4-nitrophenyl, 2-allyloxyphenyl, 3-sec.-butyl-4-methylphenyl, 4-methyl-3-isopropyl-phenyl, 2-dimethylaminophenyl, or 1-naphthyl radical.

3,954,837

SUBSTITUTED ALLOPHANATES

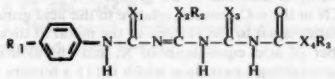
Russell F. Bellina, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 12, 1973, Ser. No. 405,800

Int. Cl.^{2} C07C *127/19, 155/02, 157/09*

U.S. Cl. 260—471 C **5 Claims**

1. Compounds of the formula:



wherein

X_1, X_2, X_3, and X_4 and each independently selected from oxygen or sulfur;

R_1 is hydrogen, halogen, alkyl of 1 through 4 carbon atoms, methoxy or methylthio;

R_2 is alkyl of 1 through 3 carbon atoms; and

R_3 is alkyl of 1 through 3 carbon atoms.

3,954,838

PROCESS FOR PREPARING ALKYL (N-PHENYLSULFONYLOXY) CARBAMATES

Joseph Hellerbach, Basel, Switzerland; Armin Walser, West Caldwell, N.J.; Hermann Bretschneider, Innsbruck, Austria, and Werner Rudolph, Lorrach, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

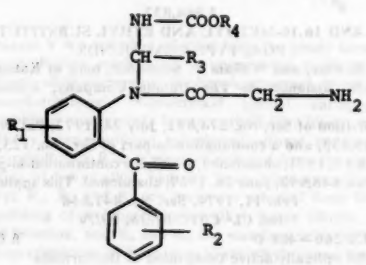
Division of Ser. No. 373,070, June 25, 1973, Pat. No. 3,853,953, which is a division of Ser. No. 111,731, Feb. 1, 1971, Pat. No. 3,772,271. This application Aug. 29, 1974, Ser. No. 501,585

Claims priority, application Switzerland, Feb. 11, 1970, 111731/70

Int. Cl.^{2} C07D *125/06*

U.S. Cl. 260—471 C **1 Claim**

1. A process for preparing a compound of the formula:



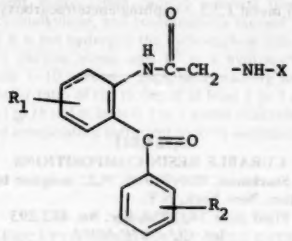
wherein

R_1 signifies halogen or nitro;

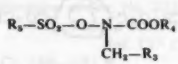
R_2 signifies hydrogen or halogen;

R_3 signifies hydrogen, lower alkyl or aryl and

R_4 signifies lower alkyl which comprises reacting a compound of the formula



wherein R_1 and R_2 are as described above, and X signifies a carbobenzoxy group with a compound of the formula



wherein R_3 and R_4 are as described above and R_5 signifies lower alkyl or a phenyl residue or a halo or lower alkyl-substituted phenyl residue, in the presence of a base and subsequently splitting off the carbobenzoxy group.

3,954,839

HINDERED HYDROXYPHENYLALKANOATES OF THIOETHER ISOPROPANOLS

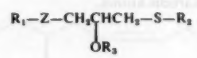
Martin Dexter, Briarcliff Manor, and David Herbert Steinberg, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,127

Int. Cl.² C07C *149/20*

U.S. Cl. 260—473 S **9 Claims**

1. A compound having the formula

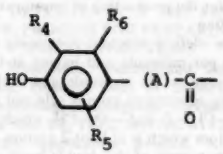


wherein

R_1 and R_2 are each independently alkyl of 1 to 30 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, alkylthioethyl of 4 to 27 atoms in the chain or alkylpolyoxyalkylene of 4 to 27 atoms in the chain having the general structure $R^o(OC_nH_{2n})_h$ or $R^o(OCH_2CHR')_h$ where R^o is alkyl of 1 to 18 carbon atoms, n is 2 to 4, R' is hydrogen, methyl or ethyl and h is 1 to 3,

Z is oxygen or sulfur,

R_3 is the group



R_4 is hydrogen, alkyl of 1 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms or α-methylbenzyl,

R_5 is alkyl of 1 to 8 carbon atoms or cycloalkyl of 5 to 6 carbon atoms,

R_6 is hydrogen or lower alkyl of 1 to 4 carbon atoms, or R_4 and R_6 together are a butylene chain which, together with the phenyl ring, form a tetrahydronaphthyl group, and provided when R_4 is hydrogen, R_6 is alkyl and R_5 is located on the carbon atom ortho to the hydroxyl group, and

A is a covalent carbon bond or a straight or branched lower alkylene having 1 to 8 carbon atoms.

3,954,840

1,3,5,7-NAPHTHALENETETRACARBOXYLIC ACIDS AND PROCESS FOR PREPARATION THEREOF

Gentaro Yamashita, Iwakuni; Yasushi Tsuru, Matsuyama; Kiyoshi Yamamoto, Iwakuni; Moriharu Yamamoto, Matsuyama; Nobuo Sakaiya, Matsuyama; Toshihiro Aoyama, Matsuyama, and Tadao Komoriya, Iwakuni, all of Japan, assignors to Teijin Ltd., Osaka, Japan

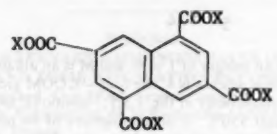
Filed Feb. 11, 1974, Ser. No. 441,626

Claims priority, application Japan, Feb. 14, 1973, 48-17420; Feb. 15, 1973, 48-17894; Mar. 3, 1973, 48-25399; Mar. 3, 1973, 48-25400; Mar. 19, 1973, 48-30872; Mar. 19, 1973, 48-30873; Mar. 29, 1973, 48-35035

Int. Cl.² C07C *63/40*, *69/76*

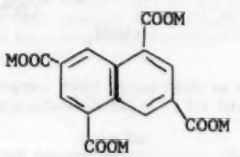
U.S. Cl. 260—475 FR **14 Claims**

1. A compound of the formula

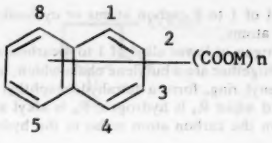


wherein the X's may be the same or different and are selected from the group consisting of hydrogen atoms, alkali metals, alkyl having 1 to 12 carbon atoms and allyl.

11. A process for preparing an alkali metal 1,3,5,7-naphthalenetetracarboxylate of the formula

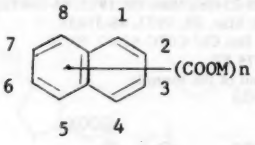


wherein M is an alkali metal, which comprises heating a mixture of at least one alkali metal naphthalenecarboxylate of the formula



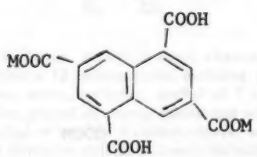
wherein *n* is an integer of 1 to 4; and M is an alkali metal with the proviso that when *n* is 4, the four —COOM groups are not present simultaneously at the 1,3,5,7-positions, and 1–40% by weight, based on the weight of the mixture, of said alkali metal 1,3,5,7-naphthalenetatracarboxylate to a temperature of at least 350°C. in an atmosphere of an inert gas and in the presence of a catalyst selected from the group consisting of the halides, oxides, sulfates, carbonates and carboxylates of zinc or cadmium and recovering the resulting alkali metal 1,3,5,7-naphthalenetetracarboxylate from the reaction mixture.

12. A process for preparing an alkali metal 1,3,5,7-naphthalenetetracarboxylate of high purity, which comprises heating at least one alkali metal naphthalenecarboxylate of the formula

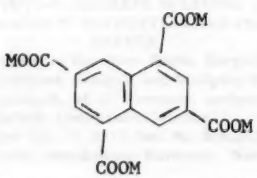


wherein *n* is an integer of 1 to 4; and M is an alkali metal with the proviso that when *n* is 4, the four —COOM groups are not present simultaneously in the 1,3,5,7-positions, to a temperature of at least 350°C. in an atmosphere of an inert gas, dissolving the reaction mixture obtained in water, adjusing the alkali ion concentration of the resulting aqueous solution to at least 6 g-alkali ion/ 1000 g-water, hot filtering the solid substance precipitated, then precipitating an alkali metal 1,3,5,7-naphthalenetetracarboxylate from the resulting filtrate, and recovering the alkali metal salt precipitated from the formed slurry.

13. A process for preparing a 3,7-dialkali 1,3,5,7-naphthalenetetracarboxylate of the formula



wherein M is an alkali metal, which comprises bringing a tetraalkali metal 1,3,5,7-naphthalenetetracarboxylate of the formula



wherein M is the same as defined above, into contact with a mineral acid in an amount of not more than 2.5 equivalents per mol of the tetraalkali metal 1,3,5,7-carboxylate or an organic acid having a pKa value of not more than 5.4 in an aqueous medium.

14. A process for preparing a 3,7-dialkali metal 1,3,5,7-naphthalenetetracarboxylate, which comprises reacting 1,3,5,7-naphthalenetetracarboxylic acid or a monoalkali metal salt thereof or a mixture of said acid and said salt with a tetraalkali metal 1,3,5,7-naphthalenetetracarboxylate.

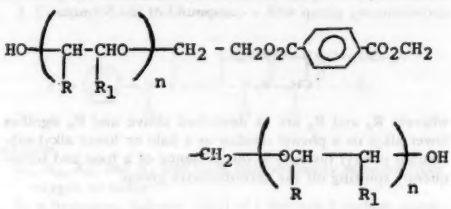
3,954,841

CURABLE RESIN COMPOSITIONS

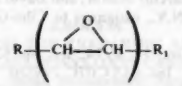
Robert W. Stackman, Morristown, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed June 24, 1974, Ser. No. 482,293
Int. Cl.[2] C07C *69/83*
U.S. Cl. 260—475 N **4 Claims**

4. A curable composition corresponding to the formula:



wherein *n* is a number between one and 10 condensation moieties of an unsaturated epoxy compound haing the formula:



wherein R is an alkenyl group of two four carbon atoms; and R_1 is selected from hydrogen and aliphatic groups containing between one and 18 carbon atoms.

3,954,842

PROCESS FOR THE PRODUCTION OF UNSATURATED ESTERS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

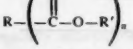
Filed May 29, 1974, Ser. No. 474,253
Int. Cl.[2] C07C *67/00, 67/03*
U.S. Cl. 260—476 R **5 Claims**

1. A process for the production of unsaturated esters which comprises reacting

a. at least one olefinic reactant containing from 3–20 carbon atoms per molecule and having at least one allylic hydrogen atom in the molecule and such olefinic reactants having substituent groups selected from —CN, —CO_2CH_3, —Cl, —F, and —O—CH_3 which are attached to a carbon atom which is at least 2 carbon atoms removed from a carbon atom of the double bond with

b. formaldehyde in the presence of

c. at least one saturated ester reactant diluent of the general formula



wherein n is an integer of 1 or 2 and wherein if n is 1, R is hydrogen or a hydrocarbon radical selected from alkyl, aryl, cycloalkyl, and combinations thereof, and wherein if n is 2, R is a divalent hydrocarbon radical selected from alkylene, arylene, cycloalkylene, and combinations thereof, and further wherein if R is not hydrogen the hydrocarbon radical contains from 1–12 carbon atoms and R′ is a hydrocarbon radical having from 1–10 carbon atoms, said reacting being carried out at a molar ratio of (a) to (b) of at least 1 to 1 and a molar ratio of (c) to (b) of at least 0.5 to 1 under reaction conditions of elevated temperature sufficient to form unsaturated esters.

3,954,843

MERCAPTO CARBOXYLIC ACID ESTERS

Daniel Helmlinger, Dubendorf; Dietmar Lamparsky, Wangen-Dubendorf; Peter Schudel, Grut; Trudi Sigg-Grütter, Winterthur, and Jost Wild, Zurich, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Continuation of Ser. No. 223,044, Dec. 2, 1971, abandoned. This application Mar. 29, 1974, Ser. No. 456,339

Int. Cl.² C07C *149/20*

U.S. Cl. 260—481 R **2 Claims**

1. A compound selected from the group consisting of 3-mercapto-hexanoic acid ethyl ester, 3-mercapto-octanoic acid ethyl ester, 3-mercapto-decanoic acid ethyl ester and 3-mercapto-4-methyl-caproic acid ethyl ester.

3,954,844

(5Z,13E,15S)-15-HYDROXY-11-OXOPROSTA-5,9.13-TRIEN-1-OIC ACID AND ESTERS

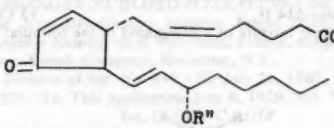
Frank B. Colton, Evanston, and Leland J. Chinn, Morton Grove, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jan. 3, 1975, Ser. No. 538,316

Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—488 R **3 Claims**

1. A compound of the formula



wherein R′ represents hydrogen or lower alkyl and R″ represents hydrogen or 1-oxo(lower alkyl).

3,954,845

SYNTHETIC DETERGENTS OF THE AMPHOLYTIC BETAINE TYPE, PROCESS FOR PREPARING THE SAME AND COMPOSITIONS

Eva Margareta Martinsson, Stenungsund, and Karl Martin Edvin Hellsten, Odsmal, both of Sweden, assignors to Modokemi Aktiebolag, Stenungsund, Sweden

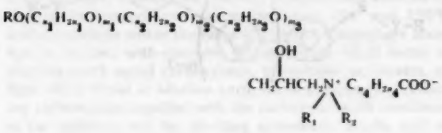
Filed Nov. 28, 1973, Ser. No. 419,856

Claims priority, application Sweden, Nov. 30, 1972, 15647/72; Nov. 30, 1972, 15648/72

Int. Cl.² C07C *101/04*

U.S. Cl. 260—501.13 **11 Claims**

1. An ampholytic betaine having the formula:



wherein

1. R is selected from the group consisting of alkyl, alkenyl, alkadienyl, alkatrienyl, and cycloalkyl groups having from about six to about twenty-two carbon atoms and alkyl phenyl and alkyl naphthyl groups linked to the oxygen of the OR group via a crabon of the phenyl or naphthyl nucleus and having from one to six alkyl groups, totalling from about four to about eighteen carbon atoms in the alkyl groups, each alkyl group having from one to about eighteen carbon atoms;
2. R_1 and R_2 are selected from the group consisting of alkyl groups having from one to about three carbon atoms;
3. n_1, n_2 and n_3 represent the number of carbon atoms in each unit, and are within the range from 2 to 4;
4 m_1, m_2 and m_3 represent the number of oxyalkylene units, and are within the range from 0 to 10, at least one of m_1, m_2 and m_3 is at least 1, and the sum of m_1, m_2 and m_3 is within the range from 1 to 10; and
5 n_4 represents the number of carbon atoms in the unit, and is within the range from 1 to 4.

3,954,846

NEW QUATERNARY AMMONIUM SALTS OF MALIC ACID AND THEIR APPLICATION IN COSMETICS

Robert Grignard, Cap D'Ail, France, assignor to Agence Nationale de Valorization de la Recherche (ANVAR), Neuilly-sur-Seine, France

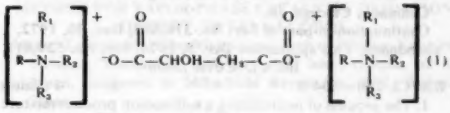
Filed Dec. 23, 1974, Ser. No. 535,713

Claims priority, application France, Dec. 21, 1973, 73.45986

Int. Cl.² C07C *87/30, 87/62, 87/68*

U.S. Cl. 260—501.15 **5 Claims**

1. Quaternary ammonium salt of malic acid having the following formula:



where: R is a radical selected from the group consisting of lauryl, myristyl, cetyl and oleyl, and R_1, R_2 and R_3 each is a radical selected from the group consisting of methyl, ethyl, propyl, isopropyl, phenyl and benzyl.

3,954,847

NEW BENZENE PHOSPHONOUS ACID COMPOUNDS, THEIR PRODUCTION AND USE AS STABILIZERS FOR ORGANIC MATERIALS

Kurt Hofer, Muenchenstein, and Guenther Tscheulin, Riehen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

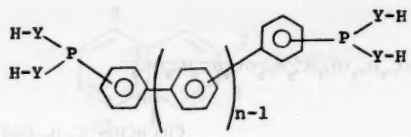
Division of Ser. No. 191,079, Oct. 20, 1971, Pat. No. 3,825,629. This application Apr. 25, 1974, Ser. No. 463,866

Claims priority, application Switzerland, Oct. 22, 1970, 15605/70; June 30, 1971, 9597/71

Int. Cl.² C07F *9/48*

U.S. Cl. 260—502.4 P **6 Claims**

1. A compound of the formula



wherein
Y is oxygen or sulphur and
n is 1 or 2,
or the sodium, potassium, barium or calcium salt thereof.

3,954,848
PROCESS FOR PRODUCING N-PHOSPHONOMETHYL GLYCINE

John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 31, 1972, Ser. No. 258,281
Int. Cl.[2] C07F *9/38*
U.S. Cl. 260—502.5 **10 Claims**

1. A process for the production of N-phosphonomethyl glycine which comprises reacting N-(phosphonomethyl-)iminodiacetic acid with an oxidizing agent selected from the group consisting of hydrogen peroxide, nitric acid, sodium hypochlorite, nitric oxide, lead tetra acetate, permanganic acid, dichromic acid, chlorine dioxide, persulfuric acid, perboric acid, tertiary-butylhydroperoxide, cumylhydroperoxide, peracetic acid, perbenzoic acid, peroxy trifluoroacetic acid, m-chloroperbenzoic acid, benzoyl-peroxide and benzene persulfonic acid in an aqueous acidic media wherein the acid is selected from the group consisting of sulfuric, hydrofluoric, phosphoric, fluorosulfuric, pyrophosphoric, nitric, acetic, formic, propionic, moni, di and trichloroacetic, mono, di and trifluoroacetic, benzenesulfonic, p-toluenesulfonic and benzenephosphonic acid and at a temperature of from about 70° to about 100°C.

3,954,849
PREPARATION OF ALKENYL SULFONATES

Robert E. Karll; Dennis G. Petrille, both of Batavia, Ill., and Edward W. Heffern, Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 316,880, Dec. 20, 1972, abandoned. This application Dec. 5, 1974, Ser. No. 529,811
Int. Cl.[2] C07B *13/00*
U.S. Cl. 260—504 S **4 Claims**

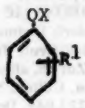
1. The process of neutralizing a sulfonation product mixture comprising alkenyl sulfonic acids wherein the alkenyl moiety is a propene or butene polymer having a number average molecular weight of about 250 to about 500 and sultones of said polymer with ammonia or sodium hydroxide, said sulfonation product mixture obtained by continuously treating a liquid propene or butene polymer having a number average molecular weight of about 250 to about 500 with gaseous sulfur trioxide which process comprises the steps of: first treating at atmospheric pressure said sulfonation product mixture at a temperature in the range of from about 100° to about 170°F with an amount of ammonia or aqueous sodium hydroxide sufficient to neutralize said sulfonic acid and provide a basic mixture comprising ammonium or sodium alkenyl sulfonates and said polymer sultones; and thereafter heating at atmospheric pressure said basic mixture to a temperature in the range of from about 290° to about 340°F to remove any water in said mixture and holding at atmospheric pressure, while maintaining the basicity of said mixture above pH 7, the anhydrous basic mixture at said temperature for a period of time sufficient to reduce the sultone content of said basic mixture and form additional alkenyl sulfonates whereby a liquid neutralized product mixture, substantially free of hydroxy alkyl sulfonates, comprising ammonium or sodium alkenyl sulfonates is obtained.

3,954,850
CARBOXYLATION OF COMPOUNDS

Edwin L. Patmore, Fishkill; William R. Siegart, and Harry Chafetz, both of Poughkeepsie, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 784,901, Dec. 18, 1968, Pat. No. 3,595,907. This application Feb. 3, 1971, Ser. No. 119,431
Int. Cl.[2] C07C *51/15*
U.S. Cl. 260—514 G **4 Claims**

1. A method of producing tricyclo-[5.2.1.$0^{2,6}$] deca-3,8-diene-4,9-dicarboxylic acid and tricyclo-[5.2.1.$0^{2,6}$] deca-3,8-diene-5,5-dicarboxylic acid, comprising contacting cyclopentadiene with carbon dioxide under substantially anhydrous conditions in the presence of the base of the formula:



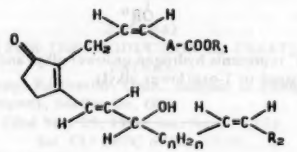
where X is sodium or potassium and R^1 is hydrogen or alkyl of 1 to 12 carbons, at a temperature between about 0° and 150°C. under a carbon dioxide pressure between about 1 and 200 atmospheres utilizing a mole ratio of base to organic compound of between about 1:1 and 20:1, subsequently acidifying the resultant reaction mixture to a pH of less than about 6 and recovering the carboxylic acid compound from the acidified mixture.

3,954,851
PGB_3 ANALOGS

Udo F. Axen, Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 412,969, Nov. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 112,032, Feb. 2, 1971, Pat. No. 3,775,462, which is a continuation-in-part of Ser. No. 30,312, April 20, 1970, abandoned. This application Oct. 30, 1974, Ser. No. 519,060
Int. Cl.[2] C07C *61/38, 69/71*
U.S. Cl. 260—514 D **13 Claims**

1. A racemic mixture of a compound of the formula:



and its mirror image, wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one to 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or β,β,β-trichloroethyl; wherein R_2 is alkyl of one to 4 carbon atoms, inclusive, substituted with zero to 3 fluoro; wherein *n* is an integer of one to 4, inclusive; wherein A is alkylene of one to 10 carbon atoms, inclusive, substituted with zero to 2 fluoro, and with one to 5 carbon atoms, inclusive, between —$COOR_1$ and

or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

3,954,852

INDENYLACETIC ACID COMPOUNDS

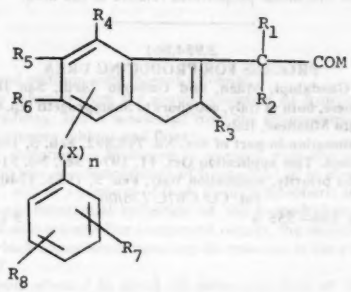
Tsung-Ying Shen, Westfield, and Howard Jones, Holmdel, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 19, 1973, Ser. No. 408,220

Int. Cl.² C07C *63/595*

U.S. Cl. 260—515 A **4 Claims**

1. A compound of the formula:



wherein

R_1, R_2, R_4, and R_6 are each hydrogen;

R_3 is C_{1-5}alkyl;

R_5 is hydrogen, halo, C_{1-5}dialkylamino, C_{2-5}alkanoyloxy, C_{2-5}alkenyl, C_{2-5}alkenyloxy, C_{1-5}alkoxy, C_{1-5}alkylthio, benzyloxy, C_{1-5}alkylsulfinyl or C_{1-5}alkyl;

R_7 is hydrogen;

R_8 is hydrogen, C_{1-5}alkylthio or C_{1-5}alkylsulfinyl;

n is 1;

X is C_{2-5}alkenylene; and

M is hydroxy, C_{1-5}alkoxy or β-D-glucopyranosiduronyl.

3,954,853

SUBSTITUTED PHENOXY-3-CHLORO-MALEALDEHYDIC ACIDS

Rene Jean Dennilauler; Maurice Edgar Pfaff, and Pierre Amédée Roman, all of Vincennes, France, assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 649,435, July 26, 1967, Pat. No. 3,579,374. This application July 9, 1970, Ser. No. 61,017

Int. Cl.² C07C *65/18*

U.S. Cl. 260—521 H **4 Claims**

1. The chemical compound 2-(p-carboxyphenoxy)-3-chloromalealdehydic acid.

3,954,854

RECOVERY OF MONOMERIC ACRYLIC ACID FROM RESIDUES ORIGINATING FROM PROCESSED CRUDE ACRYLIC ACID

Klaus Gehrmann, Erfstadt Lechenich; Heinz Erpenbach, Surth near Cologne; Georg Kohl, Hurth-Burbach, and Hans Klaus Kübbeler, Surth near Cologne, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 12, 1975, Ser. No. 549,176

Claims priority, application Germany, Feb. 15, 1974, 2407236

Int. Cl.² C07C *51/00*

U.S. Cl. 260—526 N **4 Claims**

1. A process for recovering monomeric acrylic acid from residues originating from processed crude acrylic acid and containing β-acryloyloxypropionic acid, β-acetoxypropionic acid, hydracrylic acid, dihydracrylic acid and polymeric hydracrylic acid, wherein the residues are thermally cracked by heating to temperatures within the range 130° and 250°C under pressures within the range 0.01 and 1 atmosphere absolute in contact with catalysts selected from alkali metal or alkaline earth metal carboxylates, phosphates or borates, or from alkali metal or alkaline earth metal compounds producing carboxylates together with the carboxylic acids contained in the residues, and the resulting monomeric acrylic acid so split off is distilled off.

3,954,855

PROCESS FOR PREPARING ACRYLIC ACID

Masahiro Wada, Nishinomiya; Isao Yanagisawa, Ikeda; Michikazu Ninomiya, Kobe, and Takashi Ohara, Nishinomiya, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Company Limited, Osaka, Japan

Filed Mar. 18, 1974, Ser. No. 452,348

Claims priority, application Japan, Mar. 22, 1973, 48-31830

Int. Cl.² C07C *51/26, 57/04*

U.S. Cl. 260—530 N **10 Claims**

1. A process for preparing acrylic acid which comprises catalytically oxidizing acrolein with a gas containing molecular oxygen in the vapor phase in the presence of a catalyst composition consisting essentially of a catalytic oxide supported on an inert porous carrier, prepared by depositing compounds of each of the metallic elements of said catalytic oxide on the carrier and calcining the compounds and carrier at a temperature of 300° to 800°C, said catalytic oxide having the composition of the formula

$$Mo_aV_bZ_cW_dCu_e$$

wherein Z is at least one alkaline earth metal atom selected from the group consisting of beryllium, magnesium, calcium, barium and strontium; a, b, c, d and e represent the numbers of the respective metal atoms; and when a is 12, b is 2 to 14, c is 0.1 to 6, d is 0 to 12, and e is 0 to 6, with the proviso that d plus e is not 0

and an oxygen content dependent on the atomic ratios of the metallic elements of the catalytic oxide.

3,954,856

METHOD FOR VAPOR-PHASE CATALYTIC OXIDATION OF TERT.-BUTYL ALCOHOL

Masao Kobayashi; Hideo Matsuzawa, both of Ohtake; Kantaro Yamada, Yokohama, and Hiromichi Ishii, Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1974, Ser. No. 501,681

Claims priority, application Japan, Aug. 29, 1973, 48-96948; Dec. 18, 1973, 48-142119; Dec. 20, 1973, 48-1151

Int. Cl.² C07C *51/26, 45/16*

U.S. Cl. 260—533 N **6 Claims**

1. A method for the production of methacrolein and methacrylic acid, which comprises: contacting a mixed gas containing tertbutyl alcohol and oxygen with a calcined catalyst consisting essentially of the following composition in the vapor phase at a temperature in the range from 200° to 500°C:

$$P_aW_bMo_cTe_dSb_eSn_fR_gX_hY_iO_j$$

wherein, R represents one of the combinations (a) Ni and Co, (b) Ni and Fe, (c) Ni, Co and Bi and (d) Ni, Fe and Bi; X represents K, Rb and/or Cs; Y represents Pd, U, Ge and/or Ti; a,b,c,d,e,f,g,h,i and j represent the numbers of atoms of the respective elements; and if $b + c = 1$, then a = 0-1, d = 0.001 – 1, e = 0.01 – 0.8, f = 0–1, g = 0.08 – 2, h = 0.0005 – 0.5, i = 0-2, and j is a value automatically determined by the valencies of the metallic oxides present therein, the ratio of b to c is 0.01 – 100 and the number of atoms of the two or three

individual elements constituting R falls in the scope of 0.02 – 1 when $b + c = 1$.

3,954,857

PROCESS FOR PREPARING ACETIC ACID BY GAS-PHASE OXIDATION

Rudolf Brockhaus, Marl, Germany, assignor to Chemische Werke Huls Aktiengesellschaft

Filed Oct. 18, 1974, Ser. No. 515,967

Claims priority, application Germany, Oct. 31, 1973, 2354425

Int. Cl.² C07C *51/20*

U.S. Cl. 260—533 R **4 Claims**

1. In a process for the production of acetic acid by the gas phase oxidation of butenes and of oxygen compounds derived from butene or from propene with oxygen containing gases in the presence of a calcined vanadate catalyst selected from the group consisting of tin vanadate, titanium vanadate, aluminum vanadate and mixtures thereof; the improvement comprising treating said calcined vanadate catalyst with hydrochloric acid, washing, drying and calcining said vanadate catalyst a second time, wherein said treating is carried out with 15 – 35 percent hydrochloric acid from 5 to 30 minutes at temperatures from 40° to 80°C.

3,954,858

NOVEL SEQUESTRANT BUILDERS AND METHOD OF MAKING THE SAME

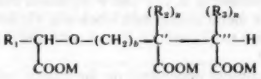
Vincent Lamberti, Upper Saddle River; Mark D. Konort, Haworth, both of N.J., and Ira Weil, New York, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 139,225, April 30, 1971. This application July 25, 1972, Ser. No. 274,954

Int. Cl.² C07C *59/22*

U.S. Cl. 260—535 P **12 Claims**

1. A compound having the general formula:



wherein R_1 is selected from the group consisting of H, an alkyl group having 1 to 12 carbon atoms; a hydroxyalkyl group having 1 to 4 carbon atoms, and a COOM group; n is zero or 1; when n is 1, R_2 and R_3 are selected from the group consisting of H, CH_3 and CH_2COOM provided that when R_1 is H, R_2 and R_3 cannot both be H; when n is zero a double bond is present between C′ and C″; b is zero or 1 and M is selected from the group consisting of H, alkali metal, ammonium and substituted ammonium cations.

3,954,859

PREPARATION OF PHOSPHINE CHLORIDES

Anthony T. Jurewicz, Kendall Park, and Warren W. Kaeding, Westfield, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 419,842, Nov. 28, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,923

Int. Cl.² C07F *9/34*

U.S. Cl. 260—543 P **21 Claims**

1. The process for reacting an unsaturated hydrocarbon selected from the group consisting of a benzene aromatic hydrocarbon and ethylene with a phosphorous halide, the phosphorous halide for reacting with the aromatic hydrocarbon being selected from the group consisting of phosphorous trihalide and phenylphosphine dihalide and the phosphorous halide for reacting with the ethylene being phosphorous trihalide, which comprises contacting said unsaturated hydrocarbon with said phosphorous halide in the presence of, as a catalyst, a crystalline aluminosilicate zeolite in the hydrogen form having a silica to alumina ratio of at least 12 and a constraint index of 1 to 12, said contacting being at a temperature of 147° to 475°C sufficient to effect reaction of said unsaturated hydrocarbon with said phosphorous halide.

3,954,860

PHOSPHOROUS COMPOUNDS

Gail H. Birum, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 6, 1973, Ser. No. 385,779

Int. Cl.² C07F *9/32, 9/40, 9/53*

U.S. Cl. 260—553 R **1 Claim**

1. Process for the preparation of diphenyl (1-ureidobutyl)-phosphine oxide which comprises heating ethyl diphenylphosphinite with urea and n-butyraldehyde with the proviso that ethyl diphenylphosphinite and n-butyraldehyde are used in less than two molar proportions relative to the urea.

3,954,861

PROCESS FOR PRODUCING UREA

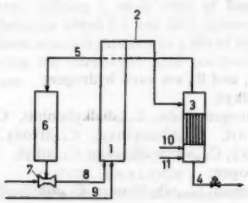
Mario Guadalupi, Milan, and Umberto Zardi, San Donato Milanese, both of Italy, assignors to Snamprogetti S.p.A, San Donato Milanese, Italy

Continuation-in-part of Ser. No. 795,892, Feb. 3, 1969, abandoned. This application Oct. 11, 1974, Ser. No. 514,237

Claims priority, application Italy, Feb. 5, 1968, 12409/68

Int. Cl.² C07C *126/00*

U.S. Cl. 260—555 A **5 Claims**



1. In a process for the production of urea from ammonia and carbon dioxide by feeding ammonia and carbon dioxide into a reactor, reacting the ammonia and carbon dioxide so as to produce an effluent aqueous solution of urea contaminated with ammonium carbamate, stripping the ammonium carbamate from the said solution in the presence of a stripping agent selected from ammonia and carbon dioxide so as to produce an aqueous solution of urea substantially free from ammonium carbamate and a vapour phase of ammonia and carbon dioxide, and condensing ammonia and carbon dioxide to form a solution of carbamate for recycle into said reactor, the improvement which consists in recycling said ammonium carbamate to the reactor by entraining the same in a stream of ammonia fed to said reactor through an ejector.

3,954,862

PROCESS FOR PRODUCING α-6-DEOXYTETRACYCLINES

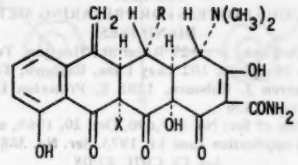
Thomas A. Morris, Jr., Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 353,084, April 20, 1973, abandoned. This application Dec. 3, 1973, Ser. No. 421,206

Int. Cl.² C07C *103/19*

U.S. Cl. 260—559 AT **25 Claims**

1. In the process of introducing hydrogen into a reaction-inert solvent medium containing a catalytic amount of rhodium metal and a tetracycline compound selected from the group consisting of a tetracycline base of the formula



and acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and hydroxy; and X is selected from the group consisting of hydrogen, chloro and fluoro;

and maintaining hydrogen in contact with the reaction mixture at a temperature of from about 0° to about 100° C. and at a pressure of from about atmospheric to 2,000 p.s.i. substantial reduction of the 6 methylene group of said tetracycline compound occurs, the improvement which comprises conducting the reaction in the presence of

a. from about 2 to about 10 moles, per mole of rhodium metal used, of a compound of the formula

$R_1R_2R_3P$

wherein each of R_1 and R_2 is selected from the group consisting of phenyl and substituted phenyl wherein the substituent is selected from the group consisting of halo, lower alkoxy, dimethylamino, and lower alkyl; and R_3 is selected from the group consisting of R_1, hydrogen and lower alkyl; and

b. from about 1.1 to about 2.0 moles of acid per mole of tetracycline base, said acid being selected from the group consisting of strong mineral acids and organic acids; or from about 0.1 to about 1.0 mole of stannous chloride per mole of tetracycline acid addition salt.

3,954,863

SYNTHESIS, POLYMERIZATION AND QUATERNIZATION OF N-SUBSTITUTED ACRYLAMIDINES

Robert Fuks, Brussels, Belgium, assignor to Union Carbide Corporation, New York, N.Y.

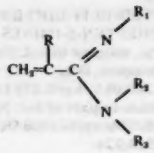
Filed May 8, 1973, Ser. No. 358,357

The portion of the term of this patent subsequent to Apr. 22, 1992, has been disclaimed.

Int. Cl.² C07C *123/00*

U.S. Cl. 260—564 R **16 Claims**

1. A process for the synthesis of N-substituted acrylamidine compounds of the formula:



which process comprises the steps of:

a. contacting an acrylonitrile compound of the formula:

$CH_2 = CRC \equiv N$

with a Lewis acid catalyst to form a first reaction compound of said acrylonitrile and said Lewis acid catalyst, and

b. contacting an alkyl halide of the formula:

R_1X

with said first reaction compound to form a second reaction compound, and

c. contacting an amine of the formula:

R_2R_3NH

with said second reaction compound to form a third reaction compound, and

d. contacting said third reaction compound with a basic solution to form a mixture and

e. separating N-substituted acrylamidine compounds from said mixture, wherein in each of the above steps R represents hydrogen or a hydrocarbyl group containing up to 12 carbon atoms and is a member selected from the group consisting of hydrogen, alkyl, alkenyl, aryl, alkaryl, aralkyl, cycloalkyl, cycloalkenyl and bicycloalkenyl; R_1 represents an alkyl group containing up to 12 carbon atoms; R_2 and R_3 represent groups each containing up to 12 carbon atoms and each are members selected from the group consisting of alkyl, alkenyl, aryl, alkaryl, aralkyl, cycloalkyl, cycloalkenyl, bicycloalkyl, haloalkyl, haloaryl, haloalkaryl, hydroxyalkyl and hydroxyalkaryl.

3,954,864

CONCENTRATED SOLUTION OF A PHOSPHATE OF A DYESTUFF OF THE AURAMINE SERIES

Jean-Claude Henri Raoul Hardouin, Chantilly, and Maurice Rene Jean Vallette, Precy-sur-Oise, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Aug. 6, 1974, Ser. No. 495,717

Claims priority, application France, Aug. 10, 1973, 73.29332

Int. Cl.² C07C *119/00*

U.S. Cl. 260—566 R **7 Claims**

1. A concentrated phosphate solution of the base of a dyestuff of the Auramine series in a hydrophilic solvent (1), which solution is stable to storage and anhydrous, said solvent being selected from the group consisting of propanol, furfuryl alcohol, tetrahydrofurfuryl alcohol, triethylene-glycol, glycol cyanohydrin, diacetone-alcohol, the methyl or ethyl ethers or thio-ethers of said solvents, acetic acid, propionic acid, glycolic acid, lactic acid, butyrolactone, methanol, ethanol, ethylene glycol, diethylene glycol, thiodiglycol, glycerine, glycol monochlorohydrin, formamide or a mixture of two or more said solvents.

3,954,865

N-CYCLOALKYL SUBSTITUTED-10,11-DIHYDRO 5H-DIBENZO[A,D] CYCLOHEPTEN-5-IMINES

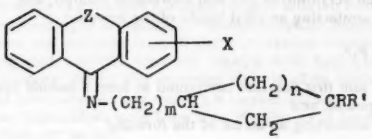
Engelbert Ciganek, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 248,065, April 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 156,472, June 24, 1971, abandoned. This application Oct. 23, 1974, Ser. No. 517,224

Int. Cl.[2] C07C *119/00*

U.S. Cl. 260—566 R 7 Claims

1. A compound of the structure



wherein Z is $-CH_2CH_2-$ or $-CH=CH-$;
R and R' are H;
X is hydrogen or halogen and
m and *n* individually are 0 or 1.

3,954,866

PROCESS FOR THE PREPARATION OF QUATERNARY ARYLAMINOALKYL PHOSPHONIUM SALTS

Arlen W. Frank, Slidell, and George L. Drake, Jr., Metairie, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 376,971, July 6, 1973, Pat. No. 3,897,205. This application Dec. 5, 1974, Ser. No. 529,975

Int. Cl.[2] C07C *85/06*

U.S. Cl. 260—568 3 Claims

1. A process for preparing a quaternary arylaminoalkyl phosphonium salt which comprises reacting a primary aromatic amine having the general formula $ArNH_2$, where Ar is a radical selected from the group consisting of phenyl, tolyl, xylyl, chlorophenyl, nitrophenyl, and naphthyl, with a quaternary hydroxyalkyl phosphonium salt having the general formula

$$[(HOCHR)_4P]^+X^-$$

where R is a radical selected from the group consisting of hydrogen, alkyl and Ar, as previously defined, and X is halogen, in a molar ratio of at least 4:1, and recovering the product therefrom.

3,954,867

CONTINUOUS PROCESS FOR PREPARING METHYLENE DIANILINES

Bernard D. Funk, Jr., 627 Regal St., Houston, Tex. 77034; Jerardo Mongiello, 102 Lazy Lane, Baytown, Tex. 78340, and Warren J. Rabourn, 1202 E. Princeton Lane, Deer Park, Tex. 77536

Continuation of Ser. No. 867,690, Oct. 20, 1969, abandoned. This application June 11, 1973, Ser. No. 368,876

Int. Cl. C07C *85/08*

U.S. Cl. 260—570 D 12 Claims

1. A continuous process for the preparation of methylene-bridged polyphenyl polyamines containing di(aminophenyl)methane having a p,p'-isomer content of at least about 98 percent which process comprises the steps of:

intimately intermixing, at a temperature of about 0°C to about 60°C, rapidly flowing fluid streams of aqueous aniline hydrochloride and aqueous formaldehyde, in the proportion of from about 4.0 moles to about 1.5 moles of aniline per mole of formaldehyde, at the entry port of a continuous tubular reactor said aqueous aniline hydrochloride stream having a water content of from 1.3 mole to 7.6 mole per mole of aniline and a hydrogen chloride content of from 0.45 to 0.95 mole per mole of aniline and said aqueous formaldehyde stream having a water content of from 2 moles to 15 moles per mole of formaldehyde;

causing said intermixed fluid streams to flow through said tubular reactor at such a rate that substantially no backmixing occurs while maintaining the temperature of the reaction mixture in said tubular reactor below about 75°C the maximum average residence time in said tubular reactor being about 32 seconds;

continuously passing said reaction mixture from the exit port of said tubular reactor to a cooling zone comprising a continuous loop incorporating a heat exchanger through which said reaction mixture is continuously recycled so as to maintain the temperature of said reaction mixture below about 60°C but above the temperature at which solid material separates from said mixture;

continuously removing reaction mixture from said cooling zone at a rate corresponding to that at which reaction mixture is fed to said cooling zone from said tubular reactor;

continuously passing reaction mixture removed from said cooling zone to one end of a final reaction zone comprising a continuous tube in which the temperature of the reaction mixture is maintained within the range of about 60°C to about 120°C; and

continuously removing from the other end of said final tubular reaction zone a mixture of methylene-bridged polyphenyl polyamines at a rate corresponding to that at which the intermediate reaction mixture from the said cooling zone is passed to the final reaction zone.

3,954,868

BIS(DIPHENYLAMINOMETHANE) ANTIMICROBIAL AGENTS

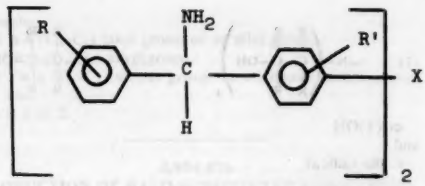
Bogislav von Schmeling, Hamden, Conn., and Walter R. Boos, Guelph, Canada, assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Montreal, Canada

Division of Ser. No. 231,385, March 2, 1972, Pat. No. 3,808,316. This application Feb. 8, 1974, Ser. No. 440,941

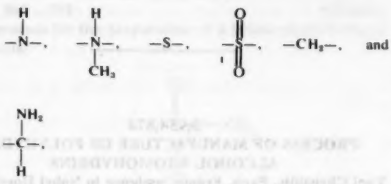
Int. Cl.[2] C07C *87/29*

U.S. Cl. 260—570 R 6 Claims

1. A chemical containing two diphenylaminomethane groups, linked together by a moiety other than oxygen, having the following formula:



wherein X is selected from the group consisting of —O(CH$_2$)$_n$O— wherein n is from 2 to 4.



and R and R′ are the same or different and are selected from the group consisting of hydrogen, methyl, methoxy, and phenoxy.

3,954,869

1-(HALO-BIPHENYL)-1-(HALO-PHENYL)-3-AMINO-PROP-1-ENES AND THE SALTS THEREOF

Paul Anthony Barrett, Beckenham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

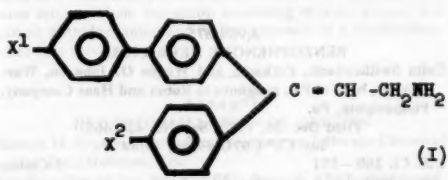
Filed Mar. 27, 1974, Ser. No. 455,386

Claims priority, application United Kingdom, Mar. 28, 1973, 14893/73

Int. Cl.² C07C *87/29*

U.S. Cl. 260—570 R **24 Claims**

1. A compound of formula (I),



(I)

wherein X^1 and X^2 are the same or different and each is a halogen atom.

3,954,870

METHOD OF RACEMIZATION OF OPTICALLY ACTIVE AMINES

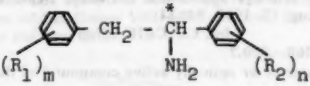
Toshitsugu Fukumaru, Kyoto, and Yoshio Suzuki, Amagasaki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 36,413, May 11, 1970, abandoned. This application Feb. 28, 1972, Ser. No. 230,036

Int. Cl.² C07C *87/28*

U.S. Cl. 260—570.5 R **5 Claims**

1. A method for racemizing optically active α,β-diphenylethylamines of the formula,



wherein R_1 and R_2 are each hydrogen or C_1 – C_4 alkyl and m and n are each an integer of 1 to 5, which comprises heating an optically active α,β-diphenylethylamine of the above-mentioned formula in the presence of an effective amount of a dry Raney nickel catalyst in the atmosphere of an inert gas at a temperature between 100°C and the boiling point of the said α,β-diphenylethylamine for a period of time between several minutes and several hours.

3,954,871

1-(4-ALKYLTHIOPHENY)-2-SUBSTITUTED AMINO-ALCOHOLS AND THEIR SALTS

Nguyen Phuc Buu-Hoi, Hue, South Vietnam; Georges E. Lambelin, Brussels, Belgium; Joseph L. Roba, Wanlin, Belgium; Claude Gillet, and Guy D. Jacques, both of Brussels, Belgium, assignors to Continental Pharma, Ixelles, Belgium

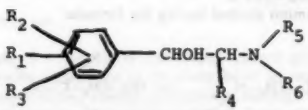
Continuation of Ser. No. 74,117, Sept. 21, 1970, abandoned. This application Mar. 29, 1974, Ser. No. 456,216

Claims priority, application Belgium, Oct. 1, 1969, 739678; Sept. 3, 1970, 93537

Int. Cl.² C07C *91/22*

U.S. Cl. 260—570.6 **9 Claims**

1. Amino-alcohols having the general formula:



wherein: R_1 represents a RS or RSO_2 group in which R is a linear or branched alkyl (C_1–C_{10}) radical; R_2 and R_3, which may be identical or different, represent a chlorine or fluorine atom or an alkyl (C_1–C_2) radical; R_4 represents a hydrogen atom or a linear or branched alkyl (C_1–C_3) radical; R_5 and R_6 which may be identical or different, represent a hydrogen atom, a linear or branched alkyl (C_1–C_{11}) radical, a cycloalkyl (C_5–C_6) radical; R_2 and R_3 can also be both hydrogen except if simultaneously R is an alkyl radical (C_1–C_3) in the groups RS or RSO_2, R_4 and R_5 are hydrogen atoms and R_6 is an isopropyl or t butyl radical; one of R_2 and R_3 can also be a hydrogen atom, the other one being a chlorine or fluorine atom or an alkyl (C_1–C_2) radical; as well as hydrochlorides, hydrobromides, phosphates, sulfates, oxalates, lactates and gluconates of said amino-alcohols.

3,954,872
1-(2',6'-DIMETHYL-PHENOXY)-2-AMINO-ALKANES AND SALTS THEREOF

Herbert Koppe; Karl Zeile; Werner Kummer; Helmut Stahle, and Peter Danneberg, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

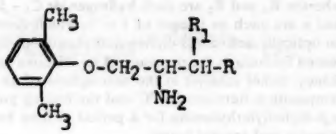
Continuation-in-part of Ser. No. 86,983, Nov. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 871,619, Nov. 14, 1969, abandoned, which is a continuation of Ser. No. 667,665, Sept. 14, 1967, abandoned. This application Oct. 1, 1974, Ser. No. 511,063

Claims priority, application Germany, Sept. 16, 1966, 88950; Aug. 17, 1967, 94024

Int. Cl.² C07C *93/06*

U.S. Cl. 260—570.7 **4 Claims**

1. A racemic or optically active compound of the formula



wherein

R is hydrogen or alkyl of 1 to 3 carbon atoms and

R_1 is hydrogen or methyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,954,873
AMINO ALCOHOLS

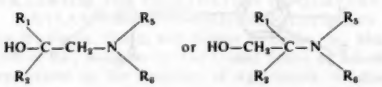
Robert M. Gipson, Austin, Tex., assignor to Robert M. Gipson, Houston, Tex.

Division of Ser. No. 263,552, June 16, 1972, Pat. No. 3,872,116. This application Apr. 17, 1974, Ser. No. 461,549

Int. Cl.² C07C *91/04*

U.S. Cl. 260—584 R **2 Claims**

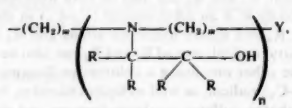
1. An amino alcohol having the formula:



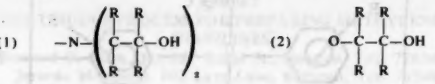
wherein, individually, R_1 and R_3 are linear C_1 to C_{38} alkyl groups and R_1 and R_2 together contain a total of 8 to 38 carbon atoms; and wherein R_5 and R_6 individually are selected from

a. alkyl, and hydroxyalkyl radicals containing from 1 to 10 carbon atoms per radical;

b. the radical



wherein R is hydrogen or C_1 to C_4 alkyl, *m* is 2 or 3, *n* is 1 to 3, and Y is



or (3)OH

and

c. the radical

wherein R is defined as in (b); provided that at least one of R_5 or R_6 is the radical (b).

3,954,874
PROCESS OF MANUFACTURE OF POLYHYDRIC ALCOHOL BROMOHYDRINS

Yani Christidis, Paris, France, assignor to Nobel Hoechst Chimie, Puteaux, France

Filed Aug. 13, 1974, Ser. No. 497,044

Claims priority, application France, Aug. 23, 1973, 73.30588

Int. Cl.² C07C *91/00, 31/34*

U.S. Cl. 260—584 R **9 Claims**

1. In a process for preparing a polyhydric alcohol bromohydrin from the group consisting in the trimethylol-ethane, trimethylol-propane, penta-erythritol, dipenta-erythritol, and trimethylol-amino-methane by the action of an aqueous solution of hydrobromic acid on the said polyhydric alcohol in the presence of acetic acid, the improvement consisting in

effecting the reaction with an aqueous solution of at least the theoretical amount of hydrobromic acid necessary to obtain said bromohydrin,

eliminating the water during the course of the reaction by distillation of a water-acetic acid mixture rich in water while maintaining the distillation temperature no greater than 103°C.,

collecting the resultant product,

subjecting this latter to a transesterification reaction with methanol, and

separating the resultant bromohydrin.

3,954,875
BENZOPHENONE HERBICIDES

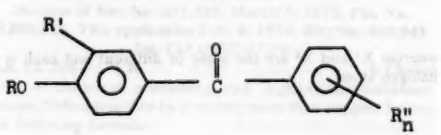
Colin Swithenbank, Perkasie, and Wayne O. Johnson, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 26, 1973, Ser. No. 428,465

Int. Cl.² C07C *49/80, 49/84*

U.S. Cl. 260—591 **3 Claims**

1. A compound of the formula



wherein
R is a (C_1–C_4) alkyl group or an allyl group,
R′ is a (C_1–C_4) alkyl group,
R″ is a (C_1–C_4) alkoxy group, or a trifluoromethyl group, and
n is 1 or 2.

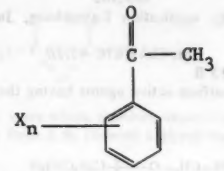
3,954,876

PRODUCTION OF HALO-SUBSTITUTED DERIVATIVES OF ACETOPHENONE

David Vofsi, Rehovot; Jonathan Freddy Cohen, Bat-Yam, both of Israel, and Michael Martan, Evanston, Ill., assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

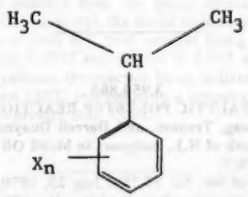
Continuation-in-part of Ser. No. 317,590, Dec. 22, 1972, abandoned. This application Nov. 4, 1974, Ser. No. 520,461
Claims priority, application Israel, Jan. 24, 1972, 38629
Int. Cl.² C07C *29/00*
U.S. Cl. 260—592 **8 Claims**

1. A process for the preparation of a haloacetophenone of the formula



wherein X is chloro or bromo and *n* is 1–3, the halo substituents being meta and/or para to the

group, said process comprising oxidizing a halocumene of the formula:



wherein X and n are as defined above at a temperature between 130°C. and 160°C. with air or oxygen, and in the presence of a catalytically effective amount of a metal phthalocyanine selected from the group consisting of iron, copper and cobalt phthalocyanine and in the presence of a dichlorobenzene as a solvent.

3,954,877

HYDROFORMYLATION OF OLEFINS

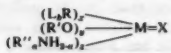
Robert M. Gipson, Austin, Tex., assignor to Jefferson Chemical Co., Inc., Houston, Tex.

Continuation of Ser. No. 674,767, Oct. 12, 1967, abandoned. This application June 7, 1974, Ser. No. 477,268
Int. Cl.² C07C *45/02*, *29/16*
U.S. Cl. 260—604 HF **9 Claims**

1. The process for the production of aldehydes and alcohols comprising the steps of:

a. Contacting in a reaction zone an olefin with hydrogen and carbon monoxide under hydroformylation conditions of 120°C to about 200°C and 1500 to 4000 psig pressure in the presence of a catalytic amount of a Group VIII metal complex catalyst thereby reacting to produce a reaction product including therein the aldehydes and alcohols, unreacted olefin and a catalyst-containing residue;
b. Passing the reaction product to a separation zone;
c. Distilling the reaction product into a vapor phase component comprising unreacted olefin, aldehydes and alcohols, and a liquid phase component including the catalyst-containing residue; and
d. Recycling at least part of the catalyst-containing residue to the reaction zone;

wherein the Group VIII metal is in complex combination with carbon monoxide and 0.5 to about 10 g. mols of a ligand per gram atom of the Group VIII metal wherein the ligand is defined by the structure:



with the equation $x + y + z = 3$ being satisfied wherein *a* is an integer from 1 to 2; *b* is an integer from 0 to 1; M is selected from the group consisting of phosphorus and arsenic; X is selected from the group consisting of oxygen and sulfur; L is selected from the group consisting of —OH —CN, and

and R, R′ and R″ are selected from the group consisting of alkyl, aryl, aralkyl, alkaryl and mixtures thereof having from 1 to about 20 carbon atoms provided that *b* only when R is alkyl.

3,954,878

SYNTHESIS OF BIS(2-SUBSTITUTED ETHYLTHIOMETHYL) ETHERS

James P. Cleveland, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 23, 1974, Ser. No. 517,133
Int. Cl.² C07C *149/14*
U.S. Cl. 260—609 R **7 Claims**

1. Process for preparing bis (2-hydroxy or 2-alkoxy substituted ethylthiomethyl) ethers which comprises the steps of (1) reacting two mole proportions of 2-hydroxyethyl mercaptan or a 2-lower alkoxyethyl mercaptan with one mole proportion of a bis(aryloxymethyl) ether having the formula

$$(ArOCH_2)_2O$$

wherein Ar is a negatively substituted phenyl group, said reaction being carried out in the presence of an organic solvent selected from dimethyl formamide, dimetyl sulfoxide, dimethyl acetamide, N-methylpyrrolidone, butyl alcohol and ethoxyethanol and a strong aqueous base selected from sodium hydroxide and potassium hydroxide at a temperature of at least 60° to about 150°C. in an inert atmosphere and (2) extracting said bis(2-hydroxy or 2-lower alkoxy substituted ethylthiomethyl) ether.

3,954,879

PROCESS FOR PRODUCING HYDROPEROXIDES

Arno Wegerhoff, Worth (Main), and Dieter Frank, Elsenfeld, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Dec. 4, 1972, Ser. No. 311,542
Claims priority, application Germany, Dec. 2, 1971, 2159764
Int. Cl.² C07C *179/02*
U.S. Cl. 260—610 B **20 Claims**

1. In a continuous process for the production of an organic mono- or di-hydroperoxide by oxidation of its corresponding

hydrocarbon in the liquid state with oxygen or an oxygen-containing gas at an elevated temperature of approximately 80°–175°C with reference to normal pressure, the improvement which comprises:

contacting the liquid hydrocarbon with the oxygen in a reaction zone maintained at the reaction temperature to form a reaction mixture containing the hydroperoxide product together with unreacted hydrocarbon;

simultaneously subjecting the reaction mixture to a rectifying carrier gas distillation in the same zone as the reaction zone for removal of an overhead fraction consisting predominately of unreacted hydrocarbon together with the carrier gas; and

withdrawing a residual bottoms fraction from the reaction zone to separate that portion of the reaction mixture in which the hydroperoxide product is more highly concentrated.

3,954,880
METHOD FOR PRODUCING HIGH-PURITY DICUMYL PEROXIDE

Masaharu Nakayama; Isao Hayashi, and Makoto Muraguchi, all of Aichi, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 417,051, Nov. 19, 1973, abandoned. This application June 13, 1975, Ser. No. 586,640

Int. Cl.² C07C *179/04*

U.S. Cl. 260—610 A **6 Claims**

1. A method for producing dicumyl peroxide having a high purity of at least 99.0% from crude dicumyl peroxide, which comprises mixing 1 part by weight of a crude dicumyl peroxide containing 1 to 50% by weight of at least one of benzene derivatives, such as cumene, α-methylstyrene, acetophenone, phenol, α,α-dimethylbenzyl alcohol, cumene hydroperoxide, α-cumyl chloride, n-butylbenzene and t-butylbenzene, as an impurity with 1 to 100 parts by weight of a 0.005 to 2% by weight solution of a water-soluble synthetic surfactant in water at a temperature between the crystallization temperature of about 0° to 37°C of dicumyl peroxide and 80°C, emulsifying the resulting mixture, cooling the emulsion to a temperature between the coagulation temperature of about −3° to 0°C of the above described aqueous solution of surfactant and the above described crystallization temperature of dicumyl peroxide, while keeping the emulsified state, to crystallize dicumyl peroxide, separating the dicumyl peroxide crystal, and subjecting the separated dicumyl peroxide crystal to washing with water and drying.

3,954,881
PROSTANOIC ACID DERIVATIVES

Jean Bowler, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

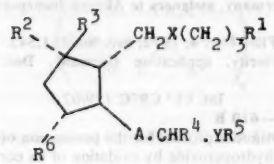
Filed July 15, 1974, Ser. No. 488,759

Claims priority, application United Kingdom, Aug. 2, 1973, 36691/73

Int. Cl.² C07C *43/20*

U.S. Cl. 260—613 D **5 Claims**

1. A prostanoic acid derivative of the formula:



wherein R^1 is alkoxymethyl of from 2 to 7 carbon atoms; X is cis-vinylene; R^2, R^4 and R^6 are each hydroxy or alkoxy of 1 to 4 carbon atoms and R^3 is hydrogen, or R^2 and R^3 together are oxo; A is trans-vinylene; Y is alkyleneoxy of 1 to 3 carbon atoms bearing 0, 1 or 2 alkyls of 1 to 3 carbon atoms, and the alkylene of the alkyleneoxy is bonded to the carbon of —CHR^4 — and the oxygen is bonded to R^5; and R^5 is phenyl or naphthyl which is unsubstituted or is substituted by chlorine, bromine, fluorine or trifluoromethyl.

3,954,882
NON-IONIC SURFACE-ACTIVE AGENTS DERIVED FROM FATTY CHAIN DIOLS

Gregoire Kalopissis, Paris, and Guy Vanlerberghe, Mitry-Mory, both of France, assignors to L'Oreal, Paris, France

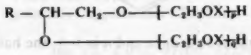
Division of Ser. No. 279,050, Aug. 9, 1972, Pat. No. 3,880,766, which is a continuation-in-part of Ser. No. 652,005, July 10, 1967, abandoned. This application Feb. 12, 1975, Ser. No. 549,302

Claims priority, application Luxemburg, July 12, 1966, 51542

Int. Cl.² C07C *43/20*

U.S. Cl. 260—613 B **1 Claim**

1. Non-ionic surface-active agents having the formula:



wherein R is selected from the group consisting of alkyl, alkenyl, alkoxyalkyl or alkylaryloxyalkyl, having 8 – 22 carbon atoms, X is $-CH_2OH$, p and q each independently represent a number between 0 and 10 inclusive, with the proviso that the sum of p and q is between 1 and 10 inclusive, and that q is other than zero when R has 8 – 12 carbon atoms and p is 1.

3,954,883
CATALYTIC POLYSTEP REACTIONS

Werner O. Haag, Trenton, and Darrell Duayne Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 57,796, July 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 672,008, Oct. 2, 1967, abandoned. This application May 10, 1974, Ser. No. 468,850

Int. Cl.² C07C *41/10*

U.S. Cl. 260—614 AA **5 Claims**

1. A method for the production of 2-methoxypropane comprising contacting acetone with methanol in the liquid phase in the presence of hydrogen at a temperature between room temperature and 180°C. and at a pressure sufficient to maintain said acetone and said methanol in the liquid phase, with, as a catalyst, a styrene-divinyl benzene cation exchange resin containing sulfonic acid group acid and a platinum or palladium metal active catalytic cites separated by distances which are of the order of the dimensions of the molecules in the reaction medium, provided however that said acid and metal are in an intraparticle dispersion which cannot be separated from each other by physical means whereby said catalyst was prepared by bringing particles of said resin into contact with a solution containing pi-complex of said metal; decomposing said pi-complex to form elemental metal; and depositing said elemental metal in and on said resin particles to form said intraparticle dispersion.

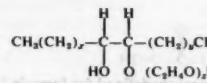
3,954,884

METHOD FOR PRODUCING BETA HYDROXY ETHYLENE GLYCOL ETHERS

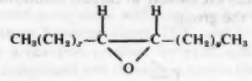
Roger L. Kidwell, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 2,350, Jan. 12, 1970, abandoned. This application July 24, 1972, Ser. No. 274,713
Int. Cl.[2] C07C *41/02, 41/10*
U.S. Cl. 260—615 R 4 Claims

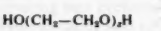
1. A method of making a beta hydroxy ethylene glycol represented by the formula



wherein *x* and *y* are integers from 0 to 16, the sum of *x* and *y* being from 8 to 16 and *z* is an integer from 1 to 5, said process comprising reacting an epoxyalkane represented by the formula



wherein *x* and *y* are whole numbers from 0 to 16, the sum of *x* and *y* being from 8 to 16 with a glycol represented by the formula



wherein *z* is an integer from 1 to 5 in the presence of an acidic catalyst represented by the formula

wherein R is selected from the group consisting of —OH, alkyl, alkyl—O—, and aryl, the molar ratio of glycol to epoxyalkane being at least 6:1, said catalyst being present in an amount of from 0.0025 equivalents to 0.015 equivalents per mole of epoxyalkane, the reaction being initiated at a temperature of at least 135°C and raised to a temperature of at least 150°C but not greater than 180°C.

3,954,885

INCREASING THE MOLECULAR WEIGHT OF LIQUID LINEAR BUTADIENE DEAD POLYMERS EMPLOYING P-TOLUENE SULFONIC ACID AS ACID CATALYST

Donald Norman Schulz, Hartville, and John Norton Anderson, Tallmadge, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Dec. 13, 1974, Ser. No. 532,555
Int. Cl.[2] C07C *47/10*; C08F *116/12, 6/00, 136/02*
U.S. Cl. 260—615 A 4 Claims

1. The process of linearly doubling the molecular weight of a liquid linear polybutadiene with a molecular weight of 200 to 10,000, which polybutadiene is terminated at one end with an alpha-alkoxyalkyl ether group and at the other end with hydrogen or hydroxyl, which process comprises heating said polybutadiene at substantially 50° to 100° C. in the substantial absence of solvent and in the presence of a dispersible or soluble acid coupling catalyst until a significant portion of the polymer chains have coupled to double their molecular weight.

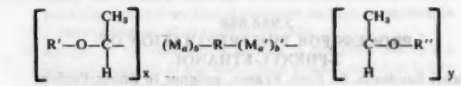
3,954,886

ALKALI STABLE POLYOXYETHYLENE ACETAL SURFACTANTS

William K. Langdon, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 22, 1974, Ser. No. 526,171
Int. Cl.[2] C07C *43/00, 43/30*
U.S. Cl. 260—615 A 6 Claims

1. A mixture of acetals having the formula:



wherein R is an organic compound selected from the group consisting of ethylene glycol, diethylene glycol, propylene glycol, dipropylene glycol, butylene glycol, trimethylolpropane, glycerine, pentaerythritol and diglycerine minus the hydrogens of the hydroxyl groups, R′ is an alkyl radical containing 8 to 30 carbon atoms, R″ is an alkyl radical containing 1 to 6 carbon atoms, M is a hydrophilic chain of units selected from the group consisting of oxyethylene and oxyethyleneoxypropylene units wherein the oxyethylene content of said hydrophilic chain is from about 75 to 100 weight percent and the oxypropylene content is from 0 to about 25 weight percent, *a* and *a′* are integers from 5 to 75, *b* and *b′* are integers from 1 to 2, *x* and *y* are integers whose sum is equal to $b + b'$ wherein the ratio of x to y is from about 19:1 to 1:1 prepared by

1. reacting a polyoxyalkylene polyol having a molecular weight range from about 2000 to about 10,000, and which is an adduct of said organic compound and ethylene oxide or a mixture of ethylene oxide and propylene oxide, wherein the oxyethylene content of said adduct is from about 75 to 100 weight percent and the oxypropylene content is from 0 to about 25 weight percent, at a temperature range from about 30° to about 80° C., with an alkyl vinyl ether containing from 10 to 32 carbon atoms in an amount sufficient to react with from 50 to 95 weight percent of the available hydroxyl groups in the presence of a catalyst selected from the group consisting of hydrochloric acid, sulfuric acid, trifluoroacetic acid, para-toluenesulfonic acid and methane sulfonic acid,
2. reacting the residual hydroxyl groups with an excess of alkyl vinyl ether containing from 3 to 8 carbon atoms, and
3. removing the excess alkyl vinyl ether of step (2).

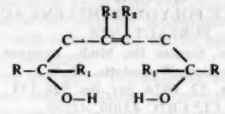
3,954,887

NOVEL ALCOHOLS

Gunther Wilke, and Paul Heimbach, both of Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

Division of Ser. No. 64,845, July 29, 1970, Pat. No. 3,832,371, which is a division of Ser. No. 678,172, Oct. 26, 1967, Pat. No. 3,544,604. This application Dec. 12, 1973, Ser. No. 424,230
Claims priority, application Germany, May 26, 1967, 26928
Int. Cl.[2] C07C *31/00*
U.S. Cl. 260—618 R 5 Claims

1. Dialcohols of the general formula



wherein R is phenyl; R_1 and R_2 are each hydrogen, or methyl.

3,954,888

PROCESS FOR THE PREPARATION OF 2-PHENYL-ETHANOL

Michel Baudouin, St. Fons, France, assignor to Rhone-Poulenc Textile, Paris Cedex, France

Filed Jan. 9, 1975, Ser. No. 539,626

Claims priority, application France, Jan. 11, 1974, 74.00985

Int. Cl.² C07C *29/00*

U.S. Cl. 260—618 R **7 Claims**

1. In a process for the preparation of 2-phenyl-ethanol which comprises:

a. reacting ethylene with benzene and a metallic carboxylate in a strong protonic acid as solvent to form a 2-phenyl-ethyl carboxylate and

b. converting the 2-phenyl-ethyl carboxylate into 2-phenyl-ethanol;

the improvement which comprises reacting ethylene with benzene and thallic trifluoroacetate in the presence of trifluoroacetic acid at a temperature of −10° to 60°C.

3,954,889

PROCESS FOR THE PRODUCTION OF 1,1,3,3-SUBSTITUTED HYDROXYINDANES

Alfons Klein, Dusseldorf; Karlfried Wedemeyer, Cologne, and Jurgen Thies, Leichlingen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

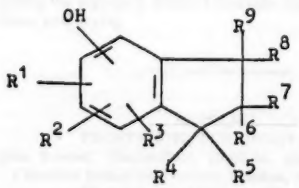
Filed Jan. 8, 1974, Ser. No. 431,801

Claims priority, application Germany, Jan. 31, 1973, 2304588; Apr. 16, 1973, 2319079

Int. Cl.² C07C *37/00, 37/14, 39/12*

U.S. Cl. 260—619 R **11 Claims**

1. Process for preparing 1,1,3,3-substituted hydroxyindanes having the formula I



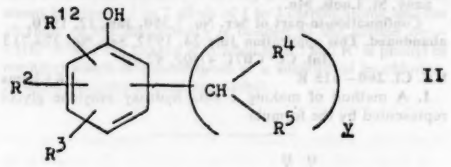
wherein

R^1, R^2 and R^3 can be the same or different and are selected from the group of hydrogen, alkyl with up to 12 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl part and up to 14 carbon atoms in the aryl part, phenyl, naphthyl, anthranyl, and the foregoing substituted by alkyl with up to 12 carbon atoms;

R^4, R^5, R^6, R^7, R^8 and R^9 can be the same or different and are selected from the group of alkyl with up to 12 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl part and up to 14 carbon atoms in the aryl part, phenyl, naphthyl, anthranyl, and the foregoing substituted by alkyl with up to 12 carbon atoms; and

R^6 and/or R^7 can also be hydrogen;

which comprises reacting an alkylphenol having the formula II



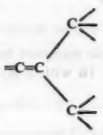
wherein

R^2, R^3, R^4 and R^5 are as previously defined for formula I and

R^{12} is as defined for R^1;

y is the integer 1 or 2

in the presence of an acid catalyst at a temperature of from 100° to 350°C with 2 moles, per mole of said alkylphenol, of an olefine in which at least one carbon atom which carries a double bond is connected exclusively to carbon atoms, that is olefines which contain the group



3,954,890

PRODUCTION OF AROMATIC BETA ALCOHOLS

James M. Watson, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Filed Mar. 23, 1972, Ser. No. 237,550

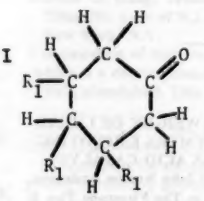
Int. Cl.² C07C *37/06, 45/00, 27/00*

U.S. Cl. 260—621 H **10 Claims**

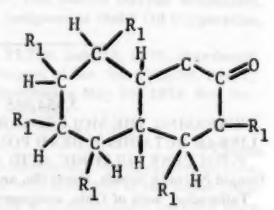
1. A process of producing a condensed ring polycyclic aromatic beta alcohol comprising:

a. reacting a first compound having a structural formula selected from:

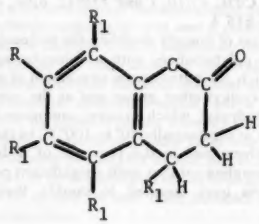
I.



II.

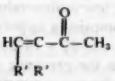


III.



wherein R_1 is selected from hydrogen, halogen and the following radicals having from 1 to about 10 carbon atoms: alkyl, alkenyl, alkynl, cycloalkyl, cycloalkenyl, aryl, aralkyl and alkoxy; with a secondary amine which will form an enamine with a cyclohexanone ring, under anhydrous conditions, and at a temperature in the range of from about 75°C to about 120°C to thereby form an enamine of said first compound;

b. forming a cycloacylated compound by contacting said enamine with a second compound having the structural formula of:



wherein R' is selected from hydrogen and alkyl, aryl, and aralkyl groups having from 1 to about 10 carbon atoms, said contacting occurring by admixing from 0.8 to 1.2 moles of said second compound with each mole of said enamine at a temperature between about 75°C and about 120°C thereby forming a reaction product between said enamine and said second compound and thereafter contacting from about 0.5 to 1 mole of acid or base with each mole of the reaction product of said enamine and said second compound to remove said secondary amine therefrom and form said cycloacylated product;

c. recovering said cycloacylated product; and

d. dehydrogenating said cycloacylated product to yield said condensed ring polycyclic aromatic beta alcohol.

3,954,891

METHOD OF MAKING SUBSTITUTED HYDROQUINONES

Winfried Orth, Hasloch, Pflaz, and Manfred Maurer, Frankenthal, Pfalx, both of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt, Germany

Filed Nov. 27, 1972, Ser. No. 309,769

Claims priority, application Germany, Dec. 7, 1971, 2160599

Int. Cl.² C07C *37/00, 37/06*

U.S. Cl. 260—621 H **18 Claims**

1. Process for the production of n-methyl hydroquinone comprising the catalytic hydrogenation of the corresponding n-methyl quinone, *n* being in each case 1–4, at 1–50 atmospheres pressure and at a temperature no greater than 60°C. in the presence of a mixture of two liquid components, each of which is present in the mixture in an effective amount to modify the effect of the other component, comprising:

as a first component, a C_1-C_3 alkanol,

as a second component, a hydrocarbon selected from the class consisting of aromatic, aliphatic, and cycloaliphatic hydrocarbons which are inert and are fluid under the hydrogenation reaction conditions,

and wherein the volume ratio of the two components of said mixture is from 1:1 to 1:2.0 between 0° and 60°C.

3,954,892

PROCESS FOR THE PURIFICATION OF PARA-NITROPHENOL

André Perrin, Isere, France, assignor to Rhone-Poulenc, S.A., Paris, France

Filed Mar. 13, 1973, Ser. No. 340,903

Claims priority, application France, Mar. 14, 1972, 72.008814

Int. Cl.² C07C *79/26*

U.S. Cl. 260—622 R **8 Claims**

1. In a process for the separation and purification of para-nitrophenol from the reaction product of the nitration of phenol with nitric acid,

isolation of the crude mixture of nitrophenols by decanting the residual aqueous solution of nitric acid and

steam distillation of ortho-nitrophenol to obtain a crude aqueous distillation residue containing dissolved para-nitrophenol, from which crystals of para-nitrophenol are precipitated on cooling and physically separated therefrom, the improvement which consists in

treating the crude distillation residue containing dissolved para-nitrophenol so that it contains sodium bisulphite in a concentration of at least 0.5%, and

if the pH of the distillation residue is not from 5.4 to 6.4 adjusting the pH of the distillation residue to 5.4 to 6.4 to precipitate crystals of para-nitrophenol.

3,954,893

HALOGENATED CYCLOBUTANES

Gerald J. O'Neill; Robert S. Holdsworth, both of Arlington, and Charles W. Simons, Bedford, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Continuation-in-part of Ser. No. 394,975, Sept. 7, 1973, Pat. No. 3,870,797, which is a continuation of Ser. Nos. 170,280, Aug. 9, 1971, abandoned, and Ser. No. 170,331, Aug. 9, 1971, abandoned, and Ser. No. 170,293, Aug. 9, 1971, abandoned, said Ser. No. 170,280, is a continuation-in-part of Ser. No. 91,521, Nov. 20, 1970, abandoned, said Ser. No. 170,331, is a continuation-in-part of Ser. No. 93,437, Nov. 27, 1970, abandoned, and Ser. No. 141,934, May 10, 1971, abandoned.

This application Jan. 10, 1975, Ser. No. 539,957

Int. Cl.² C07C *23/06*

U.S. Cl. 260—648 F **8 Claims**

1. The cyclobutanes selected from the group consisting of 1,4-dichloro-1,2,2-trifluorocyclobutane, 1-chloro-1,2,2,4-tetrafluorocyclobutane, 1,4-dichloro-1,2,2,4-tetrafluorocyclobutane, 1-chloro-1,2,2,3,3-pentafluorocyclobutane, 1,2,2-trifluorocyclobutane,[1-chloro-2,3,3,-trifluorocyclobutane, 1-chloro-2,4,4-trifluorocyclobutane 1-bromo-1,2,2-trifluorocyclobutane], 1-bromo-2-methyl-1,4,4-trifluorocyclobutane and 1-bromo-2-chloro-1,4,4-trifluorocyclobutane.

3,954,894

ORGANOTRILITHIUM POLYMERIZATION INITIATORS

Conrad W. Kamienski, and Robert C. Morrison, both of Gastonia, N.C., assignors to Lithium Corporation of America, New York, N.Y.

Filed May 18, 1973, Ser. No. 361,467

Int. Cl.² C07F *1/02*

U.S. Cl. 260—665 R **30 Claims**

1. A process for preparing hydrocarbon solvent-soluble predominately organotrilithium compounds which comprises mono-adducting an aromatic hydrocarbon containing two vinylic groups with a monolithium compound which is an alkyllithium, or an aralkyllithium in which aralkyl radical is an unsubstituted hydrocarbon radical, and then subsequently reacting the remaining vinylic linkage with an organodilithium compound consisting solely of lithium, carbon and hydrogen and capable of adducting to activated unsaturated groupings.

21. A composition containing predominately a hydrocarbon-solvent soluble organotrilithium initiator compound comprising a reaction product of (a) a mono-adduct of an aromatic hydrocarbon containing two vinylic groups with an alkyllithium with (b) an organodilithium compound consisting solely of lithium, carbon and hydrogen and capable of adducting to activated unsaturated groupings.

3,954,895

METHOD OF SEPARATING AND RECOVERING ALKENYLBENZENES AND UNREACTED ALKYLBENZENES FROM THE ALKENYLATION REACTION PRODUCT

Takeo Shima; Michiyuki Tokashiki, and Kazumi Iwata, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 27, 1975, Ser. No. 581,052
Int. Cl.² C07C 3/52
U.S. Cl. 260—668 B 4 Claims

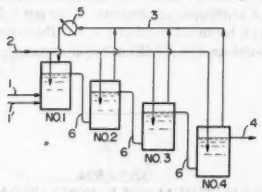
1. In the method wherein an alkenylation reaction product liquid obtained by the alkenylation reaction of an alkylbenzene and a $C_4 - C_5$ conjugated diene in the presence of alkali metal catalysts and containing unreacted alkylbenzene, alkali metal catalysts and organo-alkalimetal compounds is conveyed to a distillation zone at which said alkenylation reaction product liquid is separated by distillation to recover an alkenylbenzene-containing fraction and an unreacted alkylbenzene-containing fraction, the improvement which comprises adjusting the total of the concentrations of said alkali metal catalysts and organo-alkalimetal compounds in said alkenylation reaction product liquid introduced to the distillation zone so as to be 0.09 – 15 milligram atoms per kilogram of said product liquid, calculated as alkalimetal atoms, and thereafter conducting the distillation of said product liquid under conditions of non-addition of alcohols.

3,954,896

PROCESS FOR PREPARING MONOALKENYLBENZENES

Takeo Shima; Michiyuki Tokashiki, and Kazumi Iwata, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 27, 1975, Ser. No. 581,051
Int. Cl.² C07C 3/52
U.S. Cl. 260—668 B 4 Claims



1. In the process for preparing monoalkenylbenzenes by reacting an alkylbenzene and a $C_4 - C_5$ conjugated diene in the presence of an alkali metal catalyst while passing the reactants progressively through a series of successive reaction zones substantially isolated from each other under non-back-flow conditions, the reaction being carried out at this time while feeding said alkylbenzene and alkali metal catalyst to the first reaction zone and the conjugated diene separately to at least two of said zones, and thereafter withdrawing the reaction product from the final reaction zone of said series; the improvement which comprises

1. reacting the reactants including the alkylbenzene, $C_4 - C_5$ conjugated diene and alkali metal catalyst under boiling conditions in at least one of the reaction zones selected from the second and subsequent reaction zones; and
2. recovering the evaporated product from said reaction zone or zones as a liquid and recycling same to a reaction zone preceding that at which the product was evaporated.

3,954,897

PROCESS FOR PREPARING POLYMER OILS AND POLYMER OILS PREPARED THEREBY

Motoyuki Yamato; Hiroshi Yaginuma, and Ryuji Kita, all of Kawasaki, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Sept. 16, 1974, Ser. No. 506,074
Claims priority, application Japan, Sept. 19, 1973, 48-105640
Int. Cl.² C07C 5/04
U.S. Cl. 260—676 R 4 Claims

1. A process for preparing a colorless, odorless and transparent polymer oil having a low number average molecular weight of 300 – 1000, low iodine value and low viscosity and a high flash point, comprising copolymerizing 20 – 90% by weight of n-pentene-1 and 80 – 10% by weight of at least one other chain pentene in the presence of a Friedel-Crafts type catalyst selected from the group consisting of halides of aluminum, iron, tin and boron, at a temperature of from −50° to 150°C and a gauge pressure of from 0 to 50 kg/cm² for 10 minutes to 10 hours thereby to produce a liquid polymer having a number average molecular weight of 300 – 1000 and then catalytically hydrogenating the thus produced liquid polymer at a temperature of from room temperature to a temperature below the temperature at which the liquid polymer commences its thermal degradation, at a pressure ranging from normal atmospheric pressure to 300 atm. for about 10 minutes to about 20 hours to an extent that the hydrogenated liquid polymer has an iodine value of not more than 10, thereby obtaining the desired polymer oil.

3,954,898

POWDER COATING OF EPOXY RESIN, ACRYLIC COPOLYMER AND TERTIARY AMINE

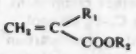
Kuniomi Hirota, Twase Kamakura; Akio Masumoto, Yokohama; Hiroshi Ozawa, Yokohama; Nobuki Kobayashi, Yokohama, and Teruo Honda, Hiratsuka, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 91,197, Nov. 19, 1970, abandoned. This application Dec. 27, 1972, Ser. No. 318,833
Claims priority, application Japan, Nov. 27, 1969, 44-94642; Dec. 29, 1969, 44-988; Feb. 12, 1970, 45-11482
Int. Cl.² C08L 63/00
U.S. Cl. 260—837 R 2 Claims

1. A process for producing a thermosetting solid coating composition which comprises mixing and melting at a temperature of from 120° to 200°C:

A. 60 to 95% by weight of total mixture of a solid copolymer of:

1. at least 30% by weight of a monomer having the formula



wherein R_1 is selected from the group consisting of H and CH_3 and R_2 is an alkyl radical containing from 1 to 14 carbon atoms;

2. from 3 to 20% by weight of a monomer selected from the group consisting of ethylenic α, β unsaturated carboxylic acids and anhydrides thereof; and
3. from 0 to 67% by weight of a monomer copolymerizable with said monomers (1) and (2), said solid copolymer having a glass transition point of from 5° to 60°C. and a number average molecular weight of from 1,500 to 30,000; and

B. 40 to 5% by weight of total mixture of an epoxy resin containing at least 2 epoxy radicals in the molecule, the sum of solid copolymer (A) and epoxy resin (B) being 100%, then adding to said mixture at a temperature not exceeding 150°C. from 0.02 to 2.0 parts by weight per 100 parts by weight of solid copolymer (A), as curing

accelerator, of a member selected from the group consisting of a tertiary amine having the formula

$$R_1 - N(R_2)(R_3)$$

wherein each of R_1, R_2 and R_3 is a member selected from the group consisting of alkyl and phenyl radicals containing from 1 to 8 carbon atoms, and substituted derivatives thereof, cooling the mixture to solidify the same and crushing the mixture to a powder.

3,954,899
EXTENSIBLE COATINGS

Wen-Hsuan Chang, Gibsonia, and Marvis E. Hartman, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 347,022, April 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 828,337, May 27, 1969, abandoned. This application Apr. 11, 1975, Ser. No. 567,219

Int. Cl.² C08L *61/20, 61/26*

U.S. Cl. 260—849 **15 Claims**

1. A one-package, storage stable coating composition consisting essentially of:

an ungelled hydroxyl-containing urethane reaction product of an organic polyisocyanate and a polyhydric material, wherein a major portion of said polyhydric material is a saturated polyester polyol formed from:

1. an alcohol component having an average functionality of at least about 1.9, and
2. a saturated acid component consisting essentially of one or more monomeric carboxylic acids or anhydrides having 2 to 14 carbon atoms per molecule, said acid component having an average functionality of at least about 1.9;

said polyhydric material containing a total of not more than one gram-mole of compounds having a functionality of 3 or more per 500 grams of polyhydric material; said urethane reaction product having a hydroxyl value of at least 10; and,

B. an amine-aldehyde condensate.

3,954,900
HEAT HARDENING MIXTURES

Wolfgang Schmalz, Wiesbaden; Walter Michel, Frankfurt am Main, and Manfred Schön, Dudenhofen, all of Germany, assignors to Cassella Farbwerke Mainkur Atiengesellschaft, Germany

Filed Mar. 24, 1975, Ser. No. 561,438

Claims priority, application Germany, Mar. 26, 1974, 2414427

Int. Cl.² C08L *61/28, 67/02*

U.S. Cl. 260—850 **14 Claims**

1. A heat-hardenable dispersion of a finely divided solid resin in liquid etherified methylolaminotriazine in which liquid the degree of methylolation averages at least about 50 percent, the degrees of etherification of the methylol groups averages at least about 70%, and about 20 to 80 mol percent of the etherifying groups are alkyl groups with up to 2 carbon atoms, the remaining etherifying groups being alkoxyethyl groups having alkoxy moieties with up to 4 carbon atoms;

the resin being an uncured mixture of about 30 to about 45% by weight of a polyester condensate with an average molecular weight about 500 to about 6000, an acid number below about 20, an OH number about 400 to about 800 and a softening temperature about 80° to about 150°C, the balance of the resin being essentially a polyurethane-forming polyisocyanate at least about half of whose isocyanate groups are masked with a lactam-masking agent that unmasks on heating to curing temperature;

the polyester condensate being essentially the polycster of (a) a mixture of isophthalic and terephthalic acids in which about 10 to about 90 mol percent is isophthalic acid, and (b) at least one saturated aliphatic polyol having 4 to 6 OH groups;

and the resin being present in an amount from about 20 to about 500% by weight of the liquid.

3,954,901
POLYESTER RESIN COMPOSITION

Toru Watanabe; Rinzo Ohno; Takashige Kato, all of Okazaki; Singo Sasaki, Ikazaki, and Kunio Tsukamoto, Okazaki, all of Japan, assignors to Nippon Ester Co., Ltd., Okazaki, Japan

Filed Jan. 9, 1974, Ser. No. 431,992

Claims priority, application Japan, Jan. 11, 1973, 48-6230; Feb. 8, 1973, 48-15903; Mar. 24, 1973, 48-33885

Int. Cl.² C08L *61/28, 63/00*

U.S. Cl. 260—850 **5 Claims**

1. A polyester resin composition for a powder paint, which is obtained by mixing a molten polyester having an average degree of polymerization ranging from about 5 to 50 and a hexaalkoxymethylmelamine or a condensate thereof as a hardener, said polyester being prepared by depolymerizing a highly polymerized polyester having an intrinsic viscosity of not less than 0.4 using a substantially non-volatile alcohol and/or a substantially non-volatile ester, said non-volatile alcohol or ester being non-volatile at about 200°–280°C, said substantially non-volatile alcohol being a polyhydric alcohol having 3 or more hydroxy groups, and said substantially non-volatile ester being the esterification product between said non-volatile polyhydric alcohol and an aliphatic monocarboxylic acid having at least one alcoholic hydroxy group in its molecule, or bis-β-hydroxyethyl terephthalate and/or β-hydroxyethyl p-hydroxyethoxybenzoate, and having as the main acid units, about 40 to 80 mol% of terephthalic acid units, about 20 to 60 mol% of p-hydroxybenzoic acid units and about 0 to 30 mol% of aliphatic dicarboxylic acid units and, as the main alcohol units, ethylene glycol units, and having free hydroxy and/or carboxy groups wherein the amount of said hexaalkoxymethylmelamine or the condensate thereof satisfies the following relationship;

$$0.5 < \frac{M}{H} \leqq 2.0$$

wherein M and H represent, respectively, the alkoxy group equivalents and the hydroxy group equivalents of said polyester resin composition.

3,954,902
POLYESTERS WITH GOOD DYEING AFFINITY AND A PROCESS FOR OBTAINING SAME

Yves Vaginay, Lyon, France, assignor to Rhone-Poulenc-Textile, Paris, France

Continuation-in-part of Ser. No. 486,499, July 8, 1974, abandoned, which is a continuation of Ser. No. 255,201, May 22, 1972, abandoned. This application Mar. 19, 1975, Ser. No. 559,792

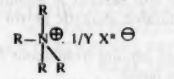
Claims priority, application France, May 24, 1971, 71.18744

Int. Cl.² C08G *39/02*

U.S. Cl. 260—860 **13 Claims**

1. A melt spinnable composition consisting essentially of a polyester of at least one aromatic dicarboxylic acid or an ester thereof and at least one dihydric alcohol, and

! – 10% of units, with respect to the sum of the recurring units of said polyester, issuing from a product having the formula



(I)

wherein the R's represent aliphatic, cycloaliphatic or aromatic radicals, at least one R being substituted by at least a group capable of forming ester bond with the recurring polyester units, the total number of said ester bonds forming groups being no greater than three,

at least two R's being capable of forming between them a ring which may contain quaternizable nitrogen atoms;

X^{n-} is a stable anion of valency n and selected from the group consisting of sulfate, sulfonate and phosphonate anions; and

Y is an integer equal to the valence of the anion.

3,954,903

IMPACT-RESISTANT RESIN COMPOSITION

Teizo Kudo; Yoshio Hashizume; Masanori Itoh, and Makoto Shiga, all of Ohimachi, Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Oct. 10, 1974, Ser. No. 513,541

Claims priority, application Japan, Oct. 13, 1973, 48-115194

Int. Cl.² C08L 67/06

U.S. Cl. 260—873 **12 Claims**

1. An impact-resistant ABS resin composition capable of being molded by fusing particles of said resin composition under conditions of low shear, in which the resin components consist essentially of a mixture of

A. a graft copolymer obtained by polymerizing under bulk polymerization conditions, with stirring, a solution of a rubbery component selected from the group consisting of polybutadiene and butadiene-styrene copolymer, dissolved in a mixture of vinyl aromatic monomer and vinyl cyanide monomer, until from 10 to 40 percent of said monomers are polymerized and a dispersed rubber phase is formed; and then adding the reaction mixture to water containing a dispersing agent suspended therein and completing polymerization of said monomer, with stirring, under suspension polymerization conditions to obtain a graft copolymer in which said monomers are graft copolymerized onto particles of said rubbery component wherein the average particle size of said rubbery component in the graft copolymer is in the range of 0.5 to 2.0 microns

B. a straight chain saturated polyester formed by condensing a dibasic acid with a glycol, said polyester having an average molecular weight of from 1000 to 5000, the amount of said polyester being in the range of from 1 to 10 parts by weight, per 100 parts by weight of said graft copolymer, said polyester being added during the bulk polymerization stage, or during the suspension polymerization stage, or after polymerization is complete.

3,954,904

STABILIZED POLYPHENYLENE ETHER RESIN COMPOSITION

Eiichi Yonemitsu, Kashiwa; Akitoshi Sugio, Omiya; Takanari Nawata; Masao Okabe, both of Tokyo; Masatsugu Matsunaga, Matsudo; Masaharu Kimura, and Norio Sayama, both of Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

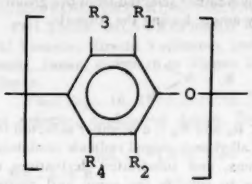
Filed Oct. 30, 1974, Ser. No. 519,195

Claims priority, application Japan, Nov. 2, 1973, 48-123732

Int. Cl.² C08L 67/06

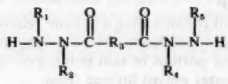
U.S. Cl. 260—873 **7 Claims**

1. In a polyphenylene ether resin composition comprising at least one member selected from the class of homopolymers and copolymers having a recurring unit of the formula



(I)

wherein R_1 is a member selected from the class of hydrogen, alkyl, halo-alkyl having at least two carbon atoms between the halogen and the phenyl nucleus, alkoxy and haloalkoxy having at least two carbon atoms between the halogen and the phenyl nucleus; R_2, R_3, and R_4 are the same or different and are selected from the class of the substituents defined for R_1 and halogen, R_1, R_2, R_3, and R_4 not being simultaneously hydrogen and not being simultaneously a substituent having a tertiary alpha carbon atom, and mixtures containing such polymers, the improvement which comprises incorporating as a stabilizer a substituted dicarboxylic acid dihydrazide having the formula



(II)

wherein R_1 and R_5 are the same or different and are selected from the class of alkyl, acyl, alkoxy, and aryl; R_2 and R_4 are the same or different and are selected from the class of hydrogen, alkyl, and aryl; and R_3 is selected from the class of alkylene and arylene.

3,954,905

MOULDING COMPOSITION OF A POLYCARBONATE, A GRAFT COPOLYMER AND A COPOLYMER AND MOULDED ARTICLES THEREFROM

Dieter Margotte, Krefeld; Karl-Heinz Ott, Leverkusen; Hermann Schirmer, Krefeld; Gunther Kampf, Krefeld-Bockum; Gunter Peilstocker, Krefeld-Bockum, and Hugo Vernaleken, Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 421,646, Dec. 3, 1973, abandoned. This application Jan. 7, 1975, Ser. No. 539,165

Claims priority, application Germany, June 9, 1973, 2329548; Oct. 25, 1973, 2353382

Int. Cl.² C08G 39/10

U.S. Cl. 260—873 **5 Claims**

1. A thermoplastic moulding composition of:

A. 10 to 50 parts of a graft polymer which has a particle size of 0.05 to 0.19 μ the graft copolymer having been prepared by grafting 10 to 35 parts of a mixture composed of (a) 50 to 90 % of styrene, or methylmethacrylate or mixtures thereof and (b) 50 to 10 % of acrylonitrile and/or acrylic acid esters onto 90 to 65 parts of a butadiene homopolymer or copolymer with up to 30 % of styrene,

B. 80 to 10 parts of a copolymer of

a. 50 to 90 % of styrene and/or α-methylstyrene and

b. 50 to 10 % of acrylonitrile and/or acrylic acid ester(s) and

C. 10 to 80 parts of polycarbonate; all parts and percentages being by weight.

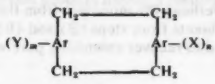
3,954,906
AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION

Franklin D. Saeva, Webster, N.Y.; Moshe Levy, Rehovot, Israel; Stephen Strella, Pittsford, N.Y.; James M. Pearson, Webster, N.Y., and David J. Williams, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 333,849, Feb. 20, 1973, Pat. No. 3,879,198. This application Oct. 30, 1974, Ser. No. 519,330
Int. Cl.² C08L *51/08, 27/02, 25/06;* **G03G** *5/09*
U.S. Cl. 260—874 **8 Claims**

1. A photoconductive composition comprising a product prepared by,

a. intimately mixing from about 0.5 to about 50 weight percent of at least one cyclic compound of the formula:



wherein Ar is a polyaromatic nucleus selected from the group consisting of diradicals of napthalene, anthracene, pyrene and carbazole; X and Y are independently selected from the group consisting of halogen, NO_2, NH_2, lower alkyl, phenyl, phenoxy, carboxy, hydroxyl, lower alkyl esters and aryl esters; and *m* and *n* range from 0 to the total number of replacable hydrogens on the polyaromatic nucleus;

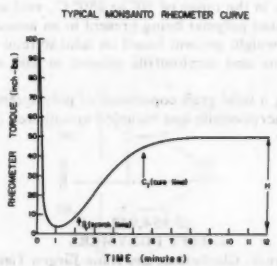
in an insulating polymeric host resin, said host resin being a solid at room temperature, substantially miscible with the above cyclic compounds, substantially non-photoconductive and thermally stable at temperatures prevailing during the polymerization of said cyclic compounds; and

b. heating the mixture to a temperature in excess of about 180° C. up to about 350° C, said temperature being sufficient to cause pyrolytic cleavage of the cyclic compound within the polymeric host resin yet insufficient to effect thermal and/or exidative degradation of the host resin.

3,954,907
COMPOSITION WITH SELECTED VINYL COMPOUNDS AND PROCESS FOR AVOIDING SCORCHING OF ETHYLENE POLYMER COMPOSITION

Donald L. Schober, Belle Mead, N.J., assignor to Union Carbide Corporation, New York, N.Y.

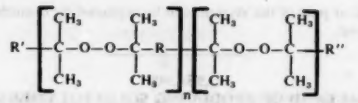
Filed Nov. 27, 1974, Ser. No. 527,855
Int. Cl.² C08F *8/00, 8/06, 255/02*
U.S. Cl. 260—875 **32 Claims**



1. A scorch resistant vulcanizable composition comprising, in weight ratio,

100 parts by weight of ethylene polymer,

about 0.1 to 5.0 parts by weight of at least one peroxide compound which has a decomposition half-life of about 0.5 to 4.5 minutes at 160° to 200°C. and has the structure



wherein R is a C_2 to C_{12} divalent hydrocarbon radical, R′ and R″ are the same or different C_1 to C_{12} monovalent hydrocarbon radicals, and *n* is a whole number of 0 or 1,

and about 0.2 to 5 parts by weight of at least one vinyl compound which has the structure

wherein R‴ is a C_1 to C_3 hydrocarbon radical,

A is an unsubstituted phenyl radical, a phenyl radical substituted with 1 to 5 C_1 to C_8 hydrocarbon radicals, or

wherein R° is a C_4 to C_{20} hydrocarbon radical,

with the proviso that the R‴ and R° radicals and the phenyl substituents are devoid of allyl or vinyl unsaturation.

3,954,908
FLAME RETARDANT RESIN COMPOSITION COMPRISING AN ACRYLONITRILE-STYRENE BASE TERPOLYMER, A DIFFERENT ACRYLONITRILE-STYRENE-CHLORINATED POLYETHYLENE TERPOLYMER AND ANTIMONY TRIOXIDE

Junichi Nakamura, Yokohama, and Masao Ogawa, Tokyo, both of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1973, Ser. No. 353,192
Claims priority, application Japan, Apr. 21, 1972, 47-39667
Int. Cl.² C08L *51/00, 53/00*
U.S. Cl. 260—876 R **19 Claims**

1. A resin composition having high flame retardancy, excellent impact strength, and good moldability or workability comprising:

1. 10 ~ 90 percent by weight of a first component comprising one or more ternary resin systems selected from the group consisting of a ternary resin comprising acrylonitrile, butadiene and styrene; a ternary resin of acrylonitrile, acrylic rubber and styrene; a ternary resin of acrylonitrile, an ethylene-propylene rubber and styrene; and a ternary resin of acrylonitrile, ethylene-vinyl acetate copolymer and styrene wherein the butadiene rubber component, acrylic rubber component, ethylene-propylene rubber component, ethylene-vinyl acetate copolymer component or mixture thereof comprisesd 10 ~ 95 percent of the first component ternary resin system and the weight ratio of acrylonitrile to styrene is 1~50/99~50;
2. 90 ~ 10 percent by weight of a second component comprising a ternary resin of acrylonitrile, chlorinated polyethylene and styrene, wherein the weight ratio of acrylonitrile to styrene is 1~50/99~50, containing 10 ~ 95 percent by weight chlorinated polyethylene having a chlorination degreee of 25 ~ 45 percent by weight, the content of said chlorinated polyethylene component in the whole resin composition being 5 ~ 40 percent by weight and the total amount of said chlorinated polyethylene component and at least one of the members selected from the group consisting of the butadiene rubber component, the acrylic rubber component, the ethylene-propylene rubber component, and the ethylene-vinyl acetate copolymer component in said ternary resins (1) being not over 50 percent by weight of the resin composition; and
3. 2 ~ 15 PHR of antimony trioxide based on 100 parts by weight of the resin composition, wherein all or part of the acrylonitrile can be replaced by methyl methacrylate and

all or part of the styrene can be replaced by α-methylstyrene.

3,954,909

METHOD OF PRODUCING SOLID POLYMERS

Lazlo J. Havas, and Pierre M. Mangin, both of Martigues, France, assignors to Naphtachimie, Paris, France

Continuation of Ser. No. 148,191, May 28, 1971, abandoned. This application July 16, 1973, Ser. No. 379,454
Claims priority, application France, June 9, 1970, 70.21067
Int. Cl.² C08F 2/14, 255/00, 10/02
U.S. Cl. 260—878 B 10 Claims

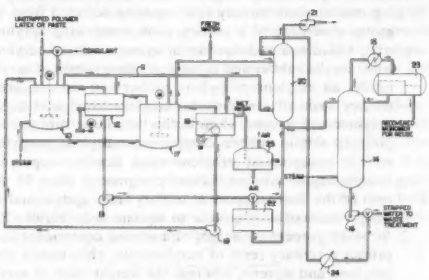
1. A method for producing solid polymers of a molecular weight of more than 50,000 from olefins having the formula CH_2=CHR, wherein R is a hydrogen atom or an alkyl radical having a maximum of 8 carbon atoms comprising polymerizing the olefins in the absence of liquid dispersion agent of a nature different from that of the olefins to be polymerized, and in contact with a prepolymer containing from 500 to 10,000 ppm of a transition metal selected from the group consisting of subgroups IV-b, V-b and VI-b of the Periodic Table of elements, said prepolymer having a specific surface area of at least 1 m^2/g being produced by the polymerization of an olefin in a dispersion liquid containing a catalytic system comprising at least one compound of a transition metal as defined above and at least one organic compound of a metal of groups II and III of the Periodic Table of elements, the resulting prepolymer then being separated from the dispersion liquid and subjected to an extraction operation by means of an anhydrous solvent to increase the surface area to at least 1 m^2/g, and impregnating the resulting prepolymer with at least one organic compound of a metal of Groups II and III.

3,954,910

PROCESS FOR REMOVAL AND RECOVERY OF UNREACTED MONOMERS FROM RESINOUS POLYMERS

Einar Peter Kropp, Mantua; John Wesley Hougland, Lima, and Gary Grant Innocenti, Sagamore Hills, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 12, 1974, Ser. No. 460,339
Int. Cl.² C08F 6/22
U.S. Cl. 260—879 8 Claims



1. In the process for producing a monomerfree resinous polymer wherein said polymer is prepared by the emulsion polymerization of a major portion of a monounsaturated nitrile and optionally another monovinyl monomer copolymerizable therewith, in an aqueous medium and optionally in the presence of a preformed diene rubber which may be a homopolymer or a copolymer of a conjugated diene monomer, and wherein the polymeric latex prepared in said polymerization reaction is coagulated, the resulting coagulum is hardened and washed with water, and the essentially monomer-free resinous polymer recovered therefrom, the improvement comprising: removing and recovering unreacted monomer from the coagulated latex of said polymer during the hardening and washing steps of the process by:

A. heating a slurry of the monomer-containing coagulum of said polymer in an aqueous bath maintained at a temperature in the range of from about 10°C above to 10°C below the heat distortion temperature of the polymer, to set the polymer and to remove some of the monomer therefrom;

B. partially dewatering the coagulum from (A);

C. washing the partially dewatered coagulum from (B) in an aqueous bath maintained at a temperature within the range of from about 20°C below and up to the heat distortion temperature of the polymer;

D. dewatering and removing any remaining monomer from the coagulum in (C) and drying and recovering the essentially monomer-free polymer therefrom;

E. scrubbing the monomer from the vapors derived from steps (A) through (D) in an aqueous absorption zone;

F. stripping overhead the monomer from the monomer-rich aqueous effluents from steps (B) and (E) and decanting the overhead to recover essentially pure monomer therefrom.

3,954,911

CHLOROBUTYL RUBBER-STYRENE-ACRYLONITRILE GRAFT COPOLYMERS

Burnett H. Johnson, and Terrence Huff, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 15, 1974, Ser. No. 497,688
Int. Cl.² C08L 9/06
U.S. Cl. 260—879 13 Claims

1. A graft copolymer comprising as the matrix a polymer of styrene or a copolymer of styrene and acrylonitrile and grafted thereto a crosslinked, chlorinated polymer consisting essentially of isobutylene and 1 to 3 weight percent isoprene and having about one atom of chlorine per double of uncrosslinked polymer, prepared by the process comprising:

crosslinking a chlorinated polymer consisting essentially of isobutylene and 1 to 3 weight percent isoprene and having about one atom of chlorine per double bond of uncrosslinked polymer,

imbibing into said crosslinked polymer, styrene or a mixture of styrene and acrylonitrile, containing from about 50 to 80 weight percent styrene, to form a gel,

dispersing said gel to a particle size wherein the crosslinked chlorinated polymer phase in said graft copolymer is less than 10μ diameter,

suspending said gel in water,

polymerizing said styrene or mixture of styrene and acrylonitrile in the presence of a free radical catalyst, at a temperature in the range of 50° to 150° C., said crosslinked, chlorinated polymer being present in an amount of from 2 to 30 weight percent based on total styrene or mixture of styrene and acrylonitrile present in said suspension, and

recovering a solid graft copolymer of polystyrene or polystyrene-acrylonitrile and included crosslinked chlorinated polymer.

3,954,912

GRAFT POLYMERS

Gerhard Werner, Glashutten, and Hans-Jürgen Tietz, Langenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Sept. 16, 1974, Ser. No. 506,019
Claims priority, application Germany, Sept. 22, 1973, 2347813
Int. Cl.² C08F 277/00
U.S. Cl. 260—880 R 12 Claims

1. A process for the preparation of a graft copolymer which comprises reacting

I. a hydrocarbon resin based on cyclopentadiene or methylcyclopentadiene which resin has been prepared by thermal polymerization of a starting material selected from the group consisting of a) technical fractions being rich in cyclopentadiene or methylcyclopentadiene or both and b) a Diels-Alder adduct obtained in an elevated temperature thermal dimerisation of a polymerizable hydrocarbon C_5-fractions

II. an olefinically unsaturated polycarboxylic acid compound and

III. a copolymerisable vinyl aromatic hydrocarbon monomer in a manner such that for at least a part of the reaction the unsaturated monomer (III) and the polycarboxylic acid compound (II) are simultaneously present to yield a reaction product having a melting point of at least 140°C.

3,954,913

STABILIZED NITRILE POLYMERS

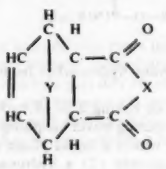
Curtis E. Uebele, Bedford, and Eddie Wardlow, Jr., Cleveland, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 6, 1975, Ser. No. 538,569

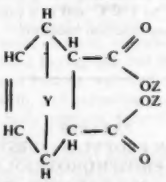
Int. Cl.² C08K *5/12, 5/15, 5/34*

U.S. Cl. 260—880 R **11 Claims**

1. A polymer composition stable toward thermal discoloration containing from about 0.05 to 2.0 parts by weight per hundred parts of resin of an organic stabilizing agent selected from the group consisting of:

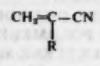


and



wherein X may be oxygen; and imide group, -NH-; or an N-substituted imide group, —NR—, wherein R may be an alkyl, or a phenyl alkyl group containing from 1 to 8 carbon atoms; Y may be an oxygen or a methylene group; and Z may be hydrogen or an alkyl group containing from 1 to 12 carbon atoms; and where said resin is composed of 100 parts by weight of:

A. at least 50% by weight of at least one nitrile having the structure

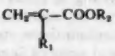


wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

B. up to 50% by weight based on the combined weight of (A) and (B) of at least one member selected from the group consisting of:

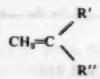
1. styrene,

2. an ester having the structure



wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

3. an alpha-olefin having the structure



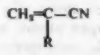
wherein R' and R'' are alkyl group having from 1 to 7 carbon atoms,

4. a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers, and

5. vinyl acetate, and

wherein said monomers are copolymerized in the presence of from 0 to 40 parts by weight of:

C. a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally a comonomer selected from the group consisting of styrene and a nitrile monomer having the structure



wherein R has the above designation, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer.

3,954,914

FLAME RETARDANT ABS AND URETHANE POLYMERS

Yong Sung Rim, Cheshire, and Walter Nudenberg, Newtown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,524

Int. Cl.² C08J *3/20*

U.S. Cl. 260—880 R **12 Claims**

1. A flame retardant comprising (1) an organic polymer selected from the group consisting of acrylonitrile-butadiene-styrene polymers and urethane polymers, and (2) an effective flame retardant amount of 2,2',3,3',4,4',5,5',7,7,7',7'-dodecachloro-1,1',2,2',5,5',6,6'-octahydro-2,2',5,5'-methanobiphenyl.

3,954,915

BLOCK COPOLYMERS OF HYDROGENATED DIENE-STYRENE WITH POLYMERIZED ALKYLENE OXIDE AND ALKYLENE SULFIDE

Frederick C. Schwab, Metuchen, and Israel J. Heilweil, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 387,845, Aug. 13, 1973, Pat. No. 3,867,295. This application June 24, 1974, Ser. No. 482,037

Int. Cl.² C08L 9/06, 43/04; C10M 1/40

U.S. Cl. 260—887 13 Claims

1. A copolymer comprising a block copolymer having within its molecular structure at least two segments, segment A being a hydrogenated random diene-styrene copolymer in which from 5 to 70% of total units of Segment A are styrene units and Segment B being selected from the group consisting of a polymerized alkylene oxide and alkylene sulfide Segment B being from 1 to about 50% by weight of final block copolymer.

3,954,916

PROCESS EMPLOYING XANTHOGEN DISULPHIDES WITH FUNCTIONAL GROUPS TO PRODUCE CHLOROPRENE POLYMER BLENDS

Rudolf Mayer-Mader, and Wilhelm Gobel, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Germany

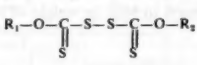
Division of Ser. No. 440,014, Feb. 6, 1974. This application Apr. 21, 1975, Ser. No. 570,099

Claims priority, application Germany, Feb. 10, 1973, 2306610; May 23, 1973, 2352937

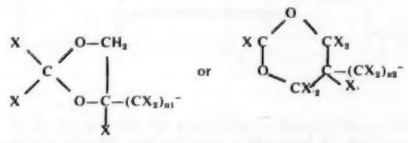
Int. Cl.² C08L 9/00, 27/00, 47/00

U.S. Cl. 260—888 4 Claims

1. A process for producing a chloroprene polymer mixture which is easy to process which comprises (A) polymerizing 60 to 100 parts by weight of chloroprene and 40 to 0 parts by weight of a member selected from the group consisting of a diene in which the hydrogen atoms may be partially or completely substituted by halogen atoms, an monoethylenically unsaturated copolymerizable monomer or a mixture thereof in the presence of 0.05 to 30 parts by weight of an xanthogen disulphide of the formula



wherein R_1 and R_2 are the same or different and are of the formula



wherein X may be the same or different and is selected from the group consisting of hydrogen, alkyl having 1 to 6 carbon atoms, phenyl, naphthyl, benzyl, chorine, bromine and iodine and n_1 and n_2 are the same or are different and are each an integer of from 1 to 20, and (B) mixing the polymer of (A) with a cross-linked benzene insoluble chloroprene homopolymer or a copolymer of 80–100 parts by weight of chloroprene and 20–0 parts by weight of at least one member selected from the group consisting of divinyl compounds and monoethylenically unsaturated copolymerizable monomers, said components of (A) and (B) being mixed in the ratio of (A) : (B) of 20 : 1 to 1 : 20.

3,954,917

METHOD OF PREPARING STABLE CONDENSATION PRODUCTS USING AN ALCOHOL-ALKYLENE OXIDE TREATMENT AND PRODUCTS THEREFROM

Milton L. Honig, New York, and Edward N. Walsh, New City, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 28, 1974, Ser. No. 473,470

Int. Cl.² C07F 9/08; C08J 9/00

U.S. Cl. 260—928 9 Claims

1. A process for forming a stabilized condensation product of a β-haloalkyl ester of a pentavalent phosphorus acid which is adapted to be incorporated in a polyurethane foam which comprises treating said product after it has had its residual acidity neutralized by treatment with an alkylene oxide with between 1 and 10% by weight of an alcohol having the formula ROH, where R is a C_1–C_{20} alkyl group or a C_1–C_{20} alkyl group containing a substituent which does not result in a reduction of fire-retardant properties for the stabilized product for a period of from 2 to 4 hours at 20° to 180°C., and thereafter treating said product with about 1% to about 10% by weight of an alkylene oxide for about 1 to 8 hours at a temperature of about 60° to 140°C.

2. A stabilized condensation product of a β-haloalkyl ester of a pentavalent phosphorus acid which is formed by the process of claim 1.

3,954,918

BISPHOSPHORAMIDES AND PROCESS FOR PREPARING THE SAME

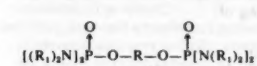
Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 284,012, Aug. 25, 1972, Pat. No. 3,868,376. This application Sept. 5, 1974, Ser. No. 499,675

Int. Cl.² C07F 9/24

U.S. Cl. 260—929 5 Claims

1. A composition of matter having the formula:



wherein:

R_1 is same or different hydrocarbyl from 1 to 24 carbon atoms; and

R is a hydrocarbylene having 2 to 18 carbon atoms.

5. A method for preparing novel bis-phosphoramides which comprises contacting within a liquid phase reaction medium (1) phosphorus oxychloride (2) a hydrocarbyl diol difunctional compound having 2 to 24 carbon atoms and (3) a dihydrocarbyl amine mono-functional compound having 1 to 24 carbon atoms, said contacting being conducted at a temperature of about 20° to 150°C and at a pressure sufficent to maintain a liquid phase reaction medium.

3,954,919

O-ETHYL-S-N-PROPYL-O-(SUBSTITUTED PHENY)-PHOSPHOROTHIOLATES

Shigeo Kishino, Tokyo; Akio Kudamatsu, and Kozo Skiokawa, both of Kanagawa, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

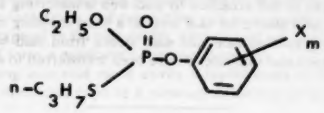
Division of Ser. No. 208,902, Dec. 16, 1971, Pat. No. 3,839,511. This application Mar. 6, 1974, Ser. No. 448,587

Claims priority, application Japan, Dec. 26, 1970, 45-118740

Int. Cl.² A01N 9/36; C07F 9/18

U.S. Cl. 260—940 8 Claims

1. A phosphoric acid ester of the formula



wherein

at least one X is nitro, cyano, lower alkylmercapto, lower alkylsulfinyl, lower alkoxycarbonyl, or lower alkylcarbonyl, and the others if present may also be halogen or lower alkyl, and

m is 1, 2 or 3.

3,954,920

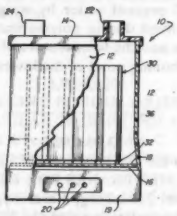
GAS HUMIDIFICATION SYSTEM

Walter I. Heath, Chicago, Ill., assignor to Parkland International Inc., Melrose Park, Ill.

Continuation of Ser. No. 394,324, Sept. 4, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,537

Int. Cl.² A61M *15/00*; **B01F** *3/04*

U.S. Cl. 261—104 **5 Claims**



1. A device for humidifying gases used in connection with medical respiratory therapy, comprising in combination,

a chamber formed by a plurality of side walls, a bottom wall, and a top wall, and having a gas inlet port and a gas outlet port associated with said chamber,

said chamber having heat means associated with said bottom wall,

said chamber being further constructed to receive and hold a quantity of water at a level above said heat means,

a humidification element having an overall size to be easily positionable within said chamber, and further being freely removeable from said chamber,

said humidification element comprising a heat conductive metallic member having one end thereof for removeably contacting said bottom wall and said heat means associated therewith, and extending upwardly therefrom and having the body portion thereof presenting a multi-faceted surface,

said humidification element being constructed in the form of a convoluted body portion thereby presenting a multi-faceted surface area throughout the entire body portion,

and a layer of water absorbent material fixedly secured to both of the opposed surfaces of the body portion of said metallic member and following the contours of said multi-faceted surfaces of said body portion such that said humidification element including said metallic member and water absorbent material covering, as a whole, is freely and easily removeable from said chamber while said humidification element provides both heat and moisture to gases passing thereacross,

said absorbent material fixedly secured to said metallic member along both of the opposed surfaces thereof extends downwardly along said metallic member to a point spaced above the lower end of said metallic member such that the lower portion of said humidification element comprises an exposed peripheral skirt of said metallic member, whereby said humidification element may be inserted within said chamber having a quantity of water disposed therein, said metallic member functioning to conduct heat from said heat means upwardly throughout said chamber while said absorbent material absorbs water by capillary action to soak said absorbent materials such that gas entering said chamber through the gas inlet port passes along and over the multi-faceted humidification element to add elevated temperatures and is humidified prior to passage out through the gas outlet port.

3,954,921

GAS-LIQUID CONTACTING METHOD AND SCRUBBER USED THEREFOR

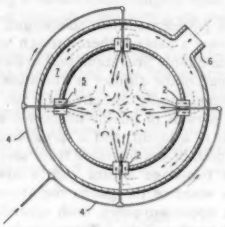
Osamu Yoshida, Yokohama; Akira Uragami, Funabashi, and Isao Furuta, Mitaka, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed June 7, 1974, Ser. No. 477,455

Claims priority, application Japan, June 9, 1973, 48-68531

Int. Cl.² B05B *7/08*, *1/14*; **B01D** *47/06*

U.S. Cl. 261—116 **2 Claims**



2. A gas-liquid contacting scrubber, comprising:

a plurality of spray nozzles for ejecting liquid in a divergent manner therefrom;

a plurality of gas ejection tubes, of constant cross-sectional configuration, respectively encompassing the outer peripheries of said spray nozzles and disposed in parallel relation with the respective longitudinal axes of said nozzles;

said nozzles being disposed within said tubes along the longitudinal axial lines thereof at such positions that the tips of said nozzles are disposed inwardly of the gas ejecting edges of said tubes so that the liquid mist sprayed through said nozzles will not impinge upon the inner peripheries of said tubes;

said nozzles and tubes being disposed in an array about an enclosed chamber, and in oppositely disposed pairs, such that the discharge ends of said nozzles and tubes are directed inwardly toward the center of said chamber and the liquid-gas discharges of said oppositely disposed paired nozzles and tubes are disposed toward each other;

a single arcuate conduit means substantially surrounding said central chamber and fluidically connected to each of said nozzles for supplying said liquid to said nozzles; and

chamber means completely surrounding said central chamber and fluidically connected to each of said tubes in a co-planar manner for supplying a positively accelerated gas to said tubes,

whereby said gas ejected from said tubes in a direction parallel to said longitudinal axes of said nozzles interacts with said liquid ejected from said nozzles in a divergent manner so as to produce turbulent flow patterns down-

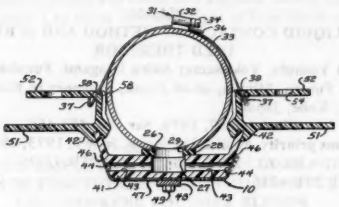
stream of said nozzles and tubes and thereby enhance the liquid-gas contact, and said liquid-gas mixtures from said nozzles and tubes interact within said central chamber as a result of said oppositely disposed paired nozzles and tubes so as to thereby enhance said liquid-gas contact still further.

3,954,922

BUBBLE-SHEARING DIFFUSER

James Donald Walker, Aurora, Ill., and Richard R. Bridge, Beloit, Wis., assignors to Peabody Galion Corporation, New York, N.Y.

Filed Feb. 28, 1974, Ser. No. 446,705
Int. Cl.² B01F 3/04
U.S. Cl. 261—121 R 3 Claims



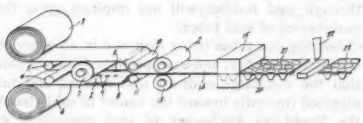
1. A diffuser for gasrelease while submerged in liquid including a body having a passage therethrough terminating in an orifice for coarse-bubble liberation, said orifice being positioned in an outer part of the diffuser at a location where it will liberate bubbles substantially directly into the surrounding liquid during long periods of bubble-liberation while the diffuser is submerged in a liquid, and a spreader close to said orifice in the rise-path of gas liberated from said orifice; said spreader being of two-stage nature with a lower spreader apertured to allow some of the gas to rise through it to the under side of the upper spreader, both spreaders being so located on the diffuser that, if the diffuser is so located that gas liberated from it causes a rolling movement of the liquid in which it is submerged, the spreaders will be swept by the rolling liquid to shear bubbles from the spreader.

3,954,923

METHOD OF MAKING COMPOSITE PLASTIC ARTICLE

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Division of Ser. No. 277,070, Aug. 2, 1972, abandoned. This application Oct. 4, 1974, Ser. No. 511,982
Int. Cl.² B29C 5/06, 5/08
U.S. Cl. 264—94 5 Claims



1. In a method of making a hollow composite article wherein a thermoplastic parison is formed in a parison mold around and in conformity with a blow core, with a preformed thermoplastic sleeve between said parison and said core, the parison, sleeve and core being subsequently confined in a blow mold and expanded therein, the improvement comprising: providing a cup-like thermoplastic sleeve on a web of thermoplastic material; partially severing said sleeve from said web while supporting said sleeve on said web so that said sleeve is readily removable therefrom; transferring said partially severed sleeve to said core; injection molding thermoplastic material about said sleeve to form said parison while said sleeve is still attached to said web transferring said parison and said sleeve on said web to a blow molding mold and separating said parison and said sleeve from said web after said parison and said sleeve have been transferred to said blow mold.

3,954,924

METHOD FOR SIMULTANEOUSLY CASTING SHEETS ON BLOCKS OF CELLULAR POLYMERIC MATERIAL

Roger Albert Castro, New Barnet; Richard John Orman, Welwyn Garden City, and James Ernest Ryan, Knebworth, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 31, 1973, Ser. No. 365,558
Claims priority, application United Kingdom, June 8, 1972, 26802/72
Int. Cl.² B29D 27/04
U.S. Cl. 264—41 3 Claims

1. A method for the simultaneous casting of a plurality of sheets or blocks of cellular polymeric material, comprising forming an emulsion having an aqueous disperse phase and a continuous phase comprising a polymerizable liquid consisting of 80 to 100 percent by weight of methyl methacrylate and 20 to 0 percent by weight of a liquid miscible and copolymerizable with the methyl methacrylate, and polymerizing said polymerizable liquid in a mold having one or more removable partitions which subdivide the emulsion during polymerization into the shapes of said sheets or blocks, the mold being thermally lagged against heat loss and the aqueous phase constituting at least 70 percent water by weight of the emulsion whereby heat evolved during polymerization is absorbed by the disperse phase and the temperature of the emulsion maintained below the boiling point of the lowest boiling fraction of said emulsion.

3,954,925

METHOD OF MAKING SEMI-PERMEABLE ASYMMETRIC MEMBRANES FOR REVERSE OSMOSIS

Karl W. Böddeker, Juliusberg, Germany, assignor to Gesellschaft fur Kernenergieverwertung in Schiffbau u. Schiffahrt mbH, Geesthacht-Tesperhude, Germany

Continuation-in-part of Ser. No. 426,903, Dec. 20, 1973, abandoned. This application Sept. 19, 1974, Ser. No. 507,471
Claims priority, application Germany, Dec. 20, 1972, 2262315
Int. Cl.² B29D 27/04
U.S. Cl. 264—41 5 Claims

1. In a phase-inversion a method of making semi-permeable asymmetric membranes for the desalination of water according to the reverse osmosis method, the improvement comprising in combination the steps of preparing a pourable cellulose acetate solution consisting essentially of cellulose acetate and acetone at a ratio within the range of from 1:2 to 1:3, and adding thereto ammonia within the range of from 2 to 5% by weight as the sole swelling agent.

3,954,926

METHOD OF MOLDING A COMPOSITE REINFORCED FOAMED PRODUCT

Fritz Wilhelm Pahl, Thuillestr. 31, 8000 Munich 60, and Jobst Harreis, Mathunistr. 17, 8000 Munich 21, both of Germany

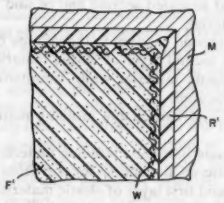
Filed June 5, 1972, Ser. No. 259,400
Claims priority, application Germany, June 3, 1971, 2127582
Int. Cl.² B29D 27/00; B29F 1/10
U.S. Cl. 264—46.4 3 Claims

1. A method of making a composite foamed body comprising the steps of:

introducing a flexible perforated reinforcing structure into a fixed volume mold cavity;

injecting an expandable polyurethane resin reactive mixture into said cavity and permitting said resin reactive mixture to expand to fill said cavity, embed said structure therein and form a reinforced foamed element;

injecting into said mold cavity a liquid mass of a settable polyurethane resin at a pressure sufficient to enable said



mass to displace said element, subsequent to expansion of said expandable resin while the latter is in a compressible but rupture-resistant state without enlargement of said mold cavity; and

hardening said mass to bond the hardened material of said mass to said element.

3,954,927
METHOD OF MAKING POROUS OBJECTS OF ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE

Iri N. Duling, West Chester, and John C. Merges, Jr., Glen Mills, both of Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 329,512, Feb. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 885,355, Dec. 15, 1969, abandoned, which is a continuation-in-part of Ser. No. 745,884, July 18, 1968, abandoned. This application Aug. 16, 1974, Ser. No. 497,603

Int. Cl.² B29D *27/00*

U.S. Cl. 264—49 **10 Claims**

1. A method of forming a porous structure comprising:

A. establishing a uniform heterogeneous composite of 5 to 50 parts by weight of polyethylene having a weight average molecular weight in excess of 1,000,000 in finely divided form and 50 to 95 parts by weight of a hydrocarbon having the following attribute:

1. a melting point at least 20°F lower than that of the polyethylene;

2. a viscosity at a temperature just above its melting point of not more than 1/10 of that of the polyethylene at a temperature just above its melting point;

3. substantial non-absorbability of the polyethylene by the hydrocarbon at a temperature below the melting point of the polyethylene but substantial absorbability of the polyethylene by said hydrocarbon at a temperature above the melting point of the polyethylene;

B. regulating the temperature of said heterogeneous composite to within a range above the melting point of the hydrocarbon but below the melting point of the polyethylene;

C. forming said composite into desired shape;

D. thereafter heating the formed shape to a temperature between the melting point and decomposition point of the polyethylene and maintaining said temperature until the particles have completely fused;

E. and thereafter removing the hydrocarbon from the cooled, formed structure.

3,954,928
PROCESS FOR MAKING SHEET-FORMED RETICULATED FIBROUS STRUCTURES

Akira Omori; Isao Okamura; Tadasi Imoto, all of Sagamihara, and Tadayuki Katoh, Tokyo, all of Japan, assignors to Teijin Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 136,511, April 22, 1971, abandoned. This application Apr. 29, 1974, Ser. No. 464,906

Claims priority, application Japan, July 28, 1970, 45-65893

Int. Cl.² B29D *27/00*

U.S. Cl. 264—51 **8 Claims**

1. A process for the preparation of unopened sheet-formed and reticulated fibrous structures, which comprises;

a. extruding a molten thermoplastic resin containing a blowing agent through a die with a slit clearance of 0.1 –1.0 mm;

b. quenching the extrudate at a point less than 5 mm away from the die surface to a temperature below the glass transition temperature of the resin; and

c. simultaneously drafting the extrudate at a draft ratio between the maximum draft ratio possible under the conditions and one-third thereof, thereby fibrillating the extrudate just as it leaves the die exit.

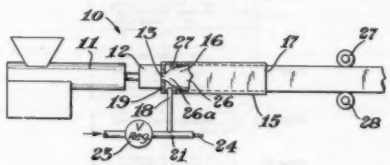
3,954,929
METHOD AND APPARATUS FOR THE EXTRUSION OF FOAMABLE THERMOPLASTIC MATERIALS

Guy A. Hoenke, Ironton, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 405,339, Oct. 11, 1973, abandoned. This application Apr. 24, 1975, Ser. No. 571,657

Int. Cl.² B29D *27/00*

U.S. Cl. 264—51 **4 Claims**



1. In a process for the preparation of synthetic resinous thermoplastic foam, the steps of the method comprising providing a heat plastified synthetic resinous thermoplastic extrudable foamable composition, extruding the composition through an extrusion orifice into a shaping channel of lower pressure, said channel having internal walls, the channel having a cross-sectional configuration generally corresponding to the shape of the product desired, the extrudable composition expanding to generally fill said channel and contact said channel walls at a location adjacent a discharge opening thereof and withdrawing the foamed product from said channel at the discharge opening remote from the extrusion orifice, the improvement which comprises providing within said channel,

at a location adjacent to the die, a gas under pressure, the gas pressure being sufficient to regulate the shape of the expanding composition at a location between the die and a location where the expanding composition contacts said channel walls.

3,954,930

CUTTING TOOL BLANK

Thomas Vasilos, Winthrop; William H. Rhodes, Lexington, and John E. Niesse, Andover, all of Mass., assignors to Avco Corporation, Cincinnati, Ohio

Filed Oct. 9, 1970, Ser. No. 79,676
Int. Cl.[2] B24D *3/06*
U.S. Cl. 264—65 **3 Claims**

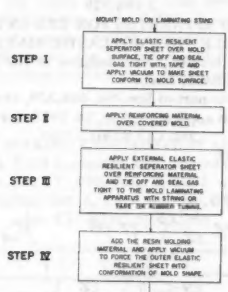
1. A process for fabricating a cutting tool from alumina which comprises hot pressing a mixture of powdered alumina, magnesia and optionally nickel oxide, the powders having a diameter of 0.5 microns or less the magnesia content being from 0.05% to 0.35% by weight of the whole, the nickel oxide content being from 0 to 0.10% by weight of the whole, and, where present, being in equal weight substitution for magnesia, and hot pressing being effected at temperatures in the range of about 1300°C to 1525°C, said mixture further being maintained under evacuated conditions of less than 100 microns during the hot pressing cycle until an average crystal size of 1 to 2 microns is produced and cooling said pressed mixture.

3,954,931

PROCESS FOR MAKING A MOLDED VALVE HOUSING FOR A PROSTHETIC LIMB

Gene R. Helmuth, Castro Valley, and Harry N. Hughes, Pleasanton, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1974, Ser. No. 460,323
Int. Cl.[2] B29D *3/02*, *23/00*; **B29G** *7/00*
U.S. Cl. 264—90 **3 Claims**


MOUNT MOLD ON LAMINATING STAND
STEP I
APPLY ELASTIC RESILIENT SEPERATOR SHEET OVER MOLD SURFACE, TIE OFF AND SEAL GAS TIGHT WITH TAPE AND APPLY VACUUM TO MAKE SHEET CONFORM TO MOLD SURFACE
STEP II
APPLY REINFORCING MATERIAL OVER COVERED MOLD
STEP III
APPLY EXTERNAL ELASTIC RESILIENT SEPERATOR SHEET OVER REINFORCING MATERIAL AND TIE OFF AND SEAL GAS TIGHT TO THE MOLD LAMINATING APPARATUS WITH STRING OR TAPE OR RUBBER TUBING
STEP IV
ADD THE RESIN MOLDING MATERIAL AND APPLY VACUUM TO FORCE THE OUTER ELASTIC RESILIENT SHEET INTO CONFORMATION OF MOLD SHAPE.
STEP IV A
REMOVE FROM MOLD AND TRIM
STEP V
FIT AND ATTACH HOUSING AS IN FIG. 2 TO SOCKET AND FINISH SOCKET

1. A process for making a molded object comprising the steps of:

a. applying a first layer of elastic resilient separator material over a molding surface of a mold;

b. sealing the perimeter of said first layer of elastic material to enclose said molding surface of said mold;

c. applying a first vacuum to the volume contained by said sealed first layer of elastic material so that said first layer of elastic material conformally encompasses said molding surface of said mold to essentially seal off said mold from the atmosphere;

d. applying resilient fiber reinforcement material over said first layer of elastic material;

e. applying a second layer of elastic resilient material having a tubular shape and a first end and a second end over and around said reinforcing material;

f. sealing said first end of said second layer of elastic material in such a way as to form a mold cavity between said layers of elastic material;

g. introducing a hardenable molding material into an unsealed second end of said second layer of elastic material;

h. sealing said unsealed second end of said second layer of elastic material;

i. applying a second vacuum to the volume contained in-between said second layer of elastic material and said first layer of elastic material while simultaneously applying said first vacuum;

j. permitting said hardenable molding material to harden; and

k. removing said hardened molding material with said reinforcing material imbedded therein from said mold and removing said first layer of elastic material from the inner surface and said second layer of elastic material from the outer surface of said hardened molding material with said reinforcing material imbedded therein to produce said molded object.

3,954,932

POLY(PHENYLENE SULFIDE) CONTAINING MIXTURES AND PROCESSES FOR PRODUCING FREE SINTERED PARTS THEREFROM

Harold D. Coale, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 26, 1974, Ser. No. 509,646
Int. Cl.[2] C08G *23/00*; **B29C** *25/00*
U.S. Cl. 264—122 **10 Claims**

1. A method for forming free sintered parts from a mixture of poly(phenylene sulfide) and at least one filler, said process including:

a. precuring a mixture of poly(phenylene sulfide), said mixture having poly(phenylene sulfide) in an amount of at least approximately 20% by weight and filler at a temperature sufficient to crosslink said poly(phenylene sulfide);

b. molding said mixture under pressure to form a desired shaped part;

c. placing said part in a free standing condition in an oven at an initial temperature below its glass transition temperature;

d. increasing the temperature of said part by gradually increasing the temperature of the oven up to a maximum temperature sufficient for curing said mixture and maintaining said part at the maximum temperature for a period of time sufficient for curing; and

e. cooling said part to room temperature.

3,954,933

RETICULAR STRUCTURE DERIVED FROM FILM AND METHOD OF MANUFACTURING SAID STRUCTURE

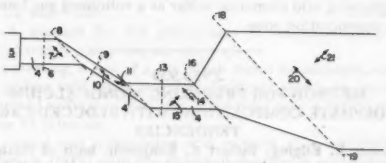
Ole-Bendt Rasmussen, Birkerod, Denmark, assignor to Societe F. Beghin, Thumeries, France

Continuation of Ser. No. 164,686, July 21, 1971, abandoned. This application Feb. 21, 1974, Ser. No. 444,503
Claims priority, application United Kingdom, July 21, 1970, 35334/70
Int. Cl.[2] B29C *17/10*
U.S. Cl. 264—145 **11 Claims**

1. A method of manufacturing a recticular sheet comprised of relatively long and thick, parallel, uniaxially oriented stemfibers and relatively short and thin intervening branchfibers integral with said stemfibers, said branchfibers being biaxially oriented and generally film-sjaped in the regions thereof adjacent to the stemfibers and generally uniaxially oriented and more fibershaped in the other regions, said process comprising

the steps of producing in a generally unoriented polymer film a pattern of alternating relatively thick elongated striations and relatively thin intervening bands, said striation and bands extending continuously across the film with their lengthwise direction making an angle in the range from a few degrees to about 90° relative to the longitudinal direction of said film; advancing the striated film in a lengthwise direction to a holding-back means engaging the film generally parallel to the striation angle, removing the film from said means along a path which is deflected transversely from said initial direction of advance at an angle which is sufficiently small to produce a substantial reduction in film width while drawing the film at a ratio of at least about 3.5:1, thereby to stretch and uniaxially orient said thin bands while said thick striations undergo bodily lengthwise displacement relative to one another without stretching; splitting the oriented intervening bands into uniaxially oriented branchfibers while maintaining said striations substantially intact and unoriented; and finally stretching said striations generally in the direction of their length to orient the same generally uniaxially in said direction, so as to form said striations into uniaxially oriented stemfibers, and simultaneously impart biaxial orientation to said branchfibers in the areas thereof adjacent to the stemfibers.

11. A method of manufacturing a recticular sheet comprised of relatively long and thick, parallel, uniaxially oriented stemfibers and relatively short and thin intervening branchfibers integral with said stemfibers, said branchfibers being biaxially oriented and generally film-shaped in the regions thereof adjacent to the stemfibers and generally uniaxially oriented and more fibershaped in the other regions, said process comprising the steps of producing in a generally unoriented polymer film a pattern of alternating relatively thick elongated striations and relatively thin intervening bands, said striation and bands extending continuously across the film with their lengthwise direction making an angle in the range from a few degrees to about 90° relative to the longitudinal direction of said film; advancing the striated film in a lengthwise direction to a holding-back means engaging the film generally parallel to the striation angle; removing the film from said means along a path which is deflected transversely from said initial direction of advance at an angle relative to said holding-back locus which is smaller than the angle of said locus relative to said advance direction, whereby the deflected film undergoes a reduction in width, while drawing the film at a ratio of at last about 3.5:1 to stretch and uniaxially orient said thin bands while said thick striations undergo bodily lengthwise displacement relative to one another without stretching; advancing the thus selectively stretched film on said deflected path to a second holding-back means engaging said film generally parallel to said striations; removing said film from said second means along a path which is further deflected from said deflected path at an angle generally reverse to said first deflection angle and sufficiently great to increase the film width and thus split the oriented intervening bands while said striations ungergo bodily lengthwise relative displacement in a generally reverse direction and remain intact; and finally stretching the entire film in the lengthwise direction of said striations to orient the same generally uniaxially in said direction, so as to form said striations into uniaxially oriented stemfibers, and simultaneously impart biaxial orientation to said branchfibers in the areas thereof adjacent to the stemfibers.



3,954,934
METHOD FOR FORMING UNIFORM MOLD CHANGES INCLUDING SEVERING A MILLED AND STRETCHED ELASTOMERIC MATERIAL

Gordon L. Newby, 320 Industrial St., Bakersfield, Calif. 93307

Division of Ser. No. 381,530, July 23, 1973, Pat. No. 381,530, which is a division of Ser. No. 224,115, Feb. 7, 1972, Pat. No. 3,758,249. This application Jan. 31, 1975, Ser. No. 545,819

Int. Cl.² B29H *3/06*

U.S. Cl. 264—146 **3 Claims**

1. A method of forming uniform slugs of a moldable elastomeric stock material having a precisely determined mass comprising:

A. continuously forming from tacky moldable elastomeric stock material an endless tacky sheet having a uniform thickness;

B. severing and removing from said sheet a continuous tacky strip having a substantially uniform thickness and width;

C. Adhering and moving said strip on a supporting surface moving at a constant velocity greater than that of said endless sheet to uniformly tension said strip lengthwise within its elastic limit,

D. and successively transversely severing portions from said strip while said strip is uniformly tensioned by repetitively driving a knife blade through said strip against said surface at regular intervals, thereby forming a succession of slugs having substantially uniform lengths.

3,954,935
PROCESS FOR PREPARING REINFORCED PLASTIC PLATES

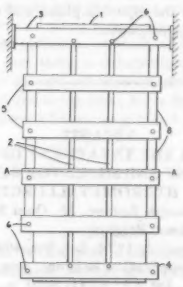
Hisashi Kato; Takuya Goto; Yasuo Hayashi; Wataru Kajihara, and Hiroshi Taniguti, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1974, Ser. No. 513,643

Claims priority, application Japan, Oct. 12, 1973, 48-114514

Int. Cl.² B29C *25/00;* B29D *3/00;* B32B *31/00*

U.S. Cl. 264—251 **8 Claims**



1. A process for preparing a completely cured, reinforced, thermosetting resin plate, comprising the steps of:

suspending in a vertical orientation an elongated, semi-cured, reinforced, thermosetting resin plate by supporting said plate only at a position adjacent the upper end thereof so that the remainder of said plate hangs vertically downwardly from said position, said plate having a length and width both of greater than 1 meter and having a plurality of lengthwise extending parallel slits therethrough beginning at a location close to the upper end of said plate and ending at a location close to the lower end of the plate, said slits each having a width of from 3 to 6 mm and adjacent slits being laterally spaced from each other a distance of from 500 millimeters to one meter;

attaching a weight only to the lower end of said suspended plate wherein said weight is from 0.5 to 1.0 Kg per cm^2 of the cross-sectional area of said plate and is effective to exert tension on said plate without causing tearing thereof;

suspending in a vertical orientation a framework so that said framework hangs downwardly from a location the upper end of said plate and is disposed between the position of suspension of said plate and said weight, said framework comprising a plurality of pairs of fixing members disposed in opposing, closely spaced relationship to the surfaces of said plate, the respective pairs of plates being vertically spaced-apart from each other, the fixing members of each pair being located on opposite sides of said plate and being spaced therefrom a small distance to limit horizontal movement of said plate;

heating said suspended plate to completely cure said resin while said weight is attached to said plate and said framework is associated therewith; then removing the framework and weight from said plate; and then filling said slits in said plate with an elastomer.

3,954,936

O-NITROSOPHENOLS AS EXTRACTANTS FOR METAL VALUES

Raymond John Shozda, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 29, 1973, Ser. No. 327,661
Int. Cl.² C01G *3/00, 45/00, 51/00, 53/00*
U.S. Cl. 423—24 **3 Claims**

1. A process for recovering at least one metal value selected from the group consisting of copper, cobalt, manganese and nickel from an aqueous solution while rejecting iron comprising contacting said aqueous solution at acid pH with an organic phase comprising a liquid, substantially water-immiscible, organic solvent and a substituted 6-chloro orthonitrosophenol wherein the substituent groups on said phenol contain 6–20 carbon atoms to extract at least a portion of the metal values in said aqueous solution and thereafter separating the organic phase from the aqueous phase and recovering metal values from the organic phase.

3,954,937

PROCESS FOR THE TREATMENT OF MATERIAL CONTAINING ZINC AND SILICA FOR RECOVERING OF ZINC BY HYDROMETALLURGIC WAY

Fernand Jacques Joseph Bodson, 35, Quai Saint Paul de Sincay, B.4900 Angleur, Belgium

Filed Aug. 2, 1974, Ser. No. 494,297
Claims priority, application Belgium, Aug. 2, 1973, 44268
Int. Cl.² C01G *9/00*
U.S. Cl. 423—101 **4 Claims**

1. A process for the treatment of a material selected from the group consisting of siliceous zinc ore and zinc containing siliceous slag, comprising finely grinding said material, forming an aqueous suspension of said finely ground material, heating said suspension to a temperature between 70° and 90°C., progressively adding to said heated suspension a solution of sulfuric acid containing 100 g/l to 200 g/l of free H_2SO_4 over a period of 3 to 10 hours in such a quantity that at the end of addition said suspension contains 1.5 to 15 g/l of free H_2SO_4, and stirring said suspension for 2 to 4 hours after the end of the acid addition while keeping the temperature between 70° and 90°C, thereby inducing simultaneously the lixiviation of the material and the reprecipitation of silica in a crystalline form, and separating said crystalline silica from said suspension.

3,954,938

REMOVAL OF HYDROGEN SULFIDE FROM REDUCING GASES

Herman P. Meissner, Winchester, Mass., assignor to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 334,396, Feb. 21, 1973, abandoned. This application Oct. 25, 1974, Ser. No. 517,949
Int. Cl.² C01B *17/04*
U.S. Cl. 423—210.5 **3 Claims**

1. A method of removing a heavy metal sulfide forming sulfur compound from hot reducing gases substantially free of oxygen, including the steps of

delivering hot reducing gases contaminated with a sulfur compound from an area of production to a cleanup zone containing lead sulfide in solid phase and molten lead reagent to form a melt present as a slurry,

contacting said hot reducing gases with said melt in said cleanup zone, the molten lead in said melt characterized by preferentially forming lead sulfide rather than a lead oxide,

moving said hot gases out of the cleanup zone as an off-gas with substantial portions of the sulfur compound removed therefrom.

withdrawing said slurry of molten lead and formed lead sulfide to a regeneration zone,

regenerating said newly formed metal sulfide to obtain molten lead reagent and elemental sulfur,

returning the regenerated metal reagent to the cleanup zone in an excess amount of at least 30 vol % relative to the amount sufficient to react with substantially all the sulfur compound in the incoming gas and to at least form a pumpable slurry of solid metal suflide and molten metal reagent, and

removing said elemental sulfur as a volitilized gas from the regeneration zone.

3,954,939

METHOD FOR PREPARING MONOCALCIUM PHOSPHATE COMPOSITIONS WITH REDUCED CAKING TENDENCIES

Thomas E. Edging; Robert E. Benjamin, both of Nashville, Tenn., and Wayne J. Balfanz, New City, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 21, 1974, Ser. No. 471,924
Int. Cl.² C01B *15/16, 25/26*
U.S. Cl. 423—311 **14 Claims**

1. A method for preparing a hydrated form of monocalcium phosphate with reduced caking tendencies which comprises intimately admixing water with a monocalcium phosphate composition having a loss on ignition at 800°C. from about 14 to less than 16.5% by weight, said water provided in an amount sufficient to increase the loss on ignition to from 17 to 21.5% by weight; permitting the water and monocalcium phosphate to remain in contact for a sufficient length of time to hydrate the monocalcium phosphate composition to a loss on ignition from 17 to 21.5% by weight and removing any free water in excess of 1%.

3,954,940

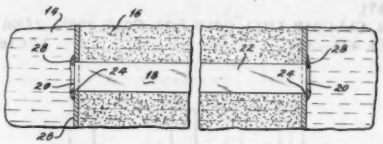
PROCESS FOR SURFACE WORK STRAIN RELIEF OF ELECTROOPTIC CRYSTALS

Robert R. Rice; Louis B. Allen, Jr.; Gordon H. Burkhart, all of St. Louis, and Herbert G. Koenig, Jr., St. Charles, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Nov. 4, 1974, Ser. No. 520,231
Int. Cl.² G02B *5/20*
U.S. Cl. 423—312 **29 Claims**

17. A process for improving characteristics including the extinction ratio of lithium tantalate electrooptic crystals having lateral surfaces and spaced optically polished end surfaces which comprises forming a pair of aligned openings in the sides of a tube, said openings being sufficiently large to receive

said crystal, passing the crystal through the pair of aligned openings so that substantially none of the lateral surfaces are outside of the tube, positioning the cyrstal so that the crystal is supported by the tube and so that the optically polished end surfaces are outside of the tube, filling the tube with an etchant selected from the group consisting of hydrofluoric acid and a combination of hydrofluoric acid and a mineral acid and simultaneously immersing the tube in a neutralizing solution



so that the optically polished end surfaces are bathed with said neutralizing solution, maintaining said condition until the etchant has etched away a minimal amount of material from the lateral surfaces of the crystal approximately equal to a few times the diameter of the largest abrasive particles used to cut said side surfaces, said tube being constructed of a material resistant to both the etchant solution and the neutralizing solution.

3,954,941

PROCESS FOR PRODUCTION OF MONOSILANDIOL

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Filed Aug. 16, 1974, Ser. No. 498,045

Int. Cl.² C01B *33/00*

U.S. Cl. 423—325 **3 Claims**

1. A process for the production of monosilandio[$SiH_2.(OH)_2$] which comprises the steps of:

a. providing 1 mol of a dry alkali metal metasilicate, and

b. adding said alkali metal metasilicate slowly to concentrated sulfuric in the ratio of 1:4 mols over a period of 10 to 15 minutes;

c. mixing and maintaining said mixture at a temperature below 100°C until the chemical reaction is completed in 1 to 4 hours;

d. filtering off water and alkali metal hydrogen sulfate from the white granular mixture of monosilanal hydrogen sulfate ($H.SiO.HSO_4$) and monosilanal dihydrogen sulfate [$SiO(HSO_4)_2$];

e. adding 3 mols of sodium carbonate to said mixture while stirring, keeping the temperature below 100°C. and the chemical reaction is completed in 20 to 30 minutes, thereby

f. producing a white granular mixture of monosilanal (H.Si-O.H) and sodium sulfate; then

g. adding water and washing said mixture,

h. filtering said mixture to remove water and sodium sulfate; thereby

i. producing a white granular compound, monosilandiol [$H_2Si(OH)_2$].

3,954,942

GRANULAR AMMONIUM PHOSPHATE SULFATE AND MONOAMMONIUM PHOSPHATE USING COMMON PIPE-CROSS-TYPE REACTOR

Frank P. Achorn, and Josiah S. Lewis, Jr., both of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 506,225, Sept. 16, 1974. This application Apr. 24, 1975, Ser. No. 571,424

Int. Cl.² C01B *15/16, 25/26*

U.S. Cl. 423—313 **11 Claims**

1. An improved process for preparing granular substantially dust free ammonium phosphate sulfates of a particle size distribution eminently suitable for subsequent bulk blending with other fertilizer values, which process comprises supplying a stream of aqueous medium to the common pipe section of a common pipe-cross-type reactor, said common pipe section being upstream from the later-mentioned cross section of said common pipe-cross-type reactor; simultaneously supplying a stream of anhydrous liquid ammonia to said common pipe section of said common pipe-cross-type reactor; supplying a stream of phosphoric acid to the cross section of said common pipe-cross-type reactor; simultaneously supplying a stream of sulfuric acid to said cross section of said common pipe-cross-type reactor, said streams of wet phosphoric acid and said sulfuric acid contacting the resulting mixture of said aqueous medium and said anhydrous liquid ammonia introduced into said common pipe section of said pipe-cross reactor at said cross section of said pipe-cross-type reactor; subsequently introducing the reaction product resulting from contacting said aqueous medium, anhydrous liquid ammonia, phosphoric acid, and sulfuric acid into a tubular extension of said common pipe-cross-type reactor to ensure continued intimate contact therebetween; subsequently discharging from about the end opposite the end of said tubular extension juxtaposed said common pipe-cross-type reactor a slurry of ammonium phosphate sulfate into the upper end of an inclined rotating drum; therein maintaining a bed of rolling discrete particles of ammonium phosphate sulfate; continuously introducing additional ammoniating fluid beneath the surface of said bed in a broad stream substantially countercurrent to the upward movement of said particles in such path, the breadth of said stream extending substantially the entire length of said bed; continuously introducing additional sulfuric acid beneath the surface of said bed in a broad stream countercurrent to the upward movement of said particles in such path, the breadth of said stream extending substantially the entire length of said bed; continuously introducing additional phosphoric acid above the surface of said bed in a broad stream substantially countercurrent to the movement of said particles in said path, the breadth of said stream extending substantially the entire length of said bed; withdrawing the resulting ammonium phosphate sulfate material from the lower end of said drum; introducing said withdrawn material into cooling means, withdrawing the resulting cooled material from said cooling means; introducing said material withdrawn from said cooling means into sizing means; returning particles of predetermined size from said sizing means into the upper end of said drum and withdrawing from said sizing means granular particles of ammonium phosphate sulfate as product, said process characterized by the fact that there is substantially no change in the moisture content of said ammonium phosphate sulfate between said step of removing same from the lower end of said drum to the recovery of same as product.

3,954,943

SYNTHESIS OF HYDROUS MAGNESIUM SILICATES

Barbara Susan Neumann, Redhill, and Keith Geoffrey Sansom, Newport Pagnell, both of England, assignors to Laporte Industries Limited, Luton, England

Filed Dec. 6, 1973, Ser. No. 422,247

Claims priority, application United Kingdom, Dec. 28, 1972, 59784/72

Int. Cl.² C01B *33/24, 33/32*

U.S. Cl. 423—331 **5 Claims**

1. A process for the preparation of a hydrous magnesium silicate having an X-ray diffraction pattern indicative of a hectorite structure and having the formula:

$$[Si_aMg_bLi_yH_cO_{20}(OH)_{4-x}F_x]^{z-}zM^+$$

where a, b, c, y and z have the following values:

a = >4.5 to <6

a = 0 to <1.5

c = 0 to <2

$a+b+c = >4$ to <8

$Y = 0$ to <4

$z = 12-2a-b-c$

$M = Na+$

comprising the steps of

a. forming a mixture of talc and sodium carbonate containing from 100g to 130g of sodium carbonate per 100g of talc,

b. heating the mixture at a temperature of from 650°C to 900°C so as to modify the talc structure and produce a partial thermal degradation product thereof as shown by an alteration in the X-ray diffraction pattern of the talc,

c. controlling the heating to retain from 1% to 11% residual volatile matter in the mixture,

d. forming a suspension of the degradation product in water,

e. introducing into the suspension a water soluble silicon compound, and precipitating silica by reacting the water soluble silicon compound with one or more alkaline sodium compounds,

f. adding to the suspension lithium and fluoride ions if y in the formula above is greater than 0,

g. controlling the quantity of the degradation product, the silica precipitated and the lithium and fluoride ions to give a Si:Mg:Li:F ratio within the ranges stated in the formula above,

h. maintaining the solids precipitated in the wet state,

i. treating the wet solids in the form of a suspension in water in the presence of 50% to 200% excess sodium compound over that providing the cation M in the above formula by heating it to cause crystal growth, for from 1 to 20 hours, at a pressure at least equal to atmospheric pressure while maintaining the presence of water in the liquid state, and

j. separating the resulting crystalline hydrous magnesium silicate.

3,954,944
FINE SILICAS

Derek Aldcroft, Wirral; Donald Barby, Great Barrow; Anthony Leonard Lovell, Wirral, and James Philip Quinn, Birkenhead, all of England, assignors to Joseph Crosfield & Sons, Ltd., Warrington, England

Filed Mar. 8, 1973, Ser. No. 339,087
Int. Cl.² C01B *33/12*
U.S. Cl. 423—335 **2 Claims**

1. A precipitated silica having:

a. an ignition weight loss of at least 3% between 120°C and 1000°C,

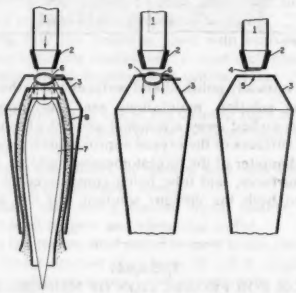
b. a strength such that a sample of the silica having a weight mean particle size on a substantially unimodal distribution in the size range 10–20 microns requires less than 6500 joules of ultrasonic energy to reduce the weight mean particle size of the sample to below 3 microns, said sample comprising 0.05 grams of said silica in 100 ml. of a 1 percent aqueous saline solution containing 0.1 percent sodium azide, and

c. after fluid energy milling, a rheological performance index of at least 7, said rheological performance index being determined by subjecting each of a plurality of samples of the milled silica dispersed in a heavy mineral oil (having a specific gravity of 0.880 to 0.900 at 60°F. and a Saybolt viscosity of 360/390 at 100°F.) to varying shear force rates to determine shear stress as a function of shear rate and to determine the apparent yield stress for the system comprising the silica dispersed in said heavy mineral oil, said samples containing a weight percent silica different from the weight percent silica in the other samples, and determining the slope of the line formed by plotting the apparent yield stress as a function of the cube of the weight percent silica in each of said samples, said slope defining the rheological performance index.

3,954,945
PROCESS FOR THE PRODUCTION OF FINELY DIVIDED OXIDES

Ludwig Lange; Jean Diether; Axel Völling, and Hans Klebe, all of Rheinfelden, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Oct. 27, 1972, Ser. No. 301,390
Claims priority, application Germany, Oct. 28, 1971, 2153671
Int. Cl.² C01B *33/12*; C01F *7/02*; C01G *49/02*, *23/06*
U.S. Cl. 423—336 **12 Claims**



1. In an improved process for the production of a finely divided oxide of Ti, Al, Fe, Zr, Si or mixtures thereof by the hydrolytic conversion of a corresponding volatile halide of Ti, Al, Fe, Zr, Si or mixtures thereof in a flame, said volatile halide being selected from the group consisting of chlorides, fluorides, bromides and iodides, wherein said volatile halide in a mixture with a combustible hydrogen-containing gas and air or oxygen are fed to a burner provided with a mouth emitting a flame, said mixture being burned in a fire tube to form a waste gas and a first portion of water vapor which will at least suffice for the hydrolysis of the volatile halide, said burner surrounded by an annular chamber forming a nozzle through which hydrogen is passed to keep the mouth of the burner free of attachments of solid substances, sufficient quantities of oxygen or air and combustible gas being introduced for the oxygen content of the mixture to be adequate to burn the combustible gas and to produce said first portion of water vapor in the course thereof, and wherein the resulting oxides are separated from other reaction products, the improvement wherein said flame is surrounded by a jacket of gases containing a second portion of water vapor in order to avoid the formation of halogen gas in waste gases.

3,954,946
PROCESS FOR REACTING NITRIC OXIDE WITH HYDROGEN

Werner Graf, Chur, and Johann Karl Forrer, Domat-Ems, both of Switzerland, assignors to Inventa AG fur Forschung und Patentverwertung, Zurich, Zurich, Switzerland

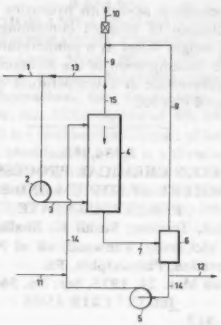
Filed July 18, 1974, Ser. No. 489,621
Int. Cl.² B01D *19/00*
U.S. Cl. 423—387 **8 Claims**

1. In a process for the production of hydroxyl amine by reaction of NO and H_2 in the presence of at least one noble metal catalyst suspended in an acid liquid, the improvement which comprises

introducing said liquid adjacent the upper end of a bubble column and flowing said liquid downwardly at a liquid flow rate, introducing said NO and H_2 adjacent the lower end of said column whereby large and small bubbles are formed in said liquid,

adjusting said flow rate so as to permit said larger gas bubbles to rise and collect adjacent the top of said column to form top gas and to carry said smaller bubbles entrained in said liquid to the lower end of said column,

removing said liquid and said smaller bubbles from the bottom of said column, separating said smaller bubbles from said liquid to form bottom gas,



returning at least a part of said bottom gas and said top gas to said lower end of said column, returning part of said liquid to the upper end of said column and withdrawing the rest of said liquid, which liquid contains said hydroxylamine.

3,954,947
RAPID STABILIZATION OF POLYACRYLONITRILE FIBERS PRIOR TO CARBONIZATION

Rostislav Didchenko, Middleburg Heights, and Charles D. Amata, Berea, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 17, 1972, Ser. No. 307,616
Int. Cl. C01b *31/07*
U.S. Cl. 423—447 **5 Claims**

1. A process for producing carbon fiber by the pyrolysis of polyacrylonitrile fiber which comprises heating polyacrylonitrile fiber in an atmosphere consisting essentially of from 5 volume percent to 50 volume percent hydrogen chloride and from 50 volume percent to 95 volume percent oxygen, under tension at least sufficient to prevent longitudinal shrinkage of the fiber, first at a temperature of from 200°C. to 270°C. for from 10 to 15 minutes, and then at a temperature of from above 270°C. to 380°C. for an additional 10 to 15 minutes, and subsequently carbonizing the so-treated fiber in an inert atmosphere at a temperature of from 1000°C. to 2000°C., the total processing time required for the production of said carbon fiber not exceeding one-half hour.

3,954,948
PROCESS FOR MANUFACTURE OF CALCIUM HYPOCHLORITE

Walter J. Sakowski, Cleveland, Ohio, assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 340,121, March 12, 1973, Pat. No. 3,895,099, and a continuation-in-part of Ser. No. 257,768, May 30, 1972, abandoned. This application Jan. 6, 1975, Ser. No. 538,682
The portion of the term of this patent subsequent to July 15, 1992, has been disclaimed.
Int. Cl.² C01B *11/06*
U.S. Cl. 423—474 **20 Claims**

1. A continuous process for preparing calcium hypochlorite which comprises:

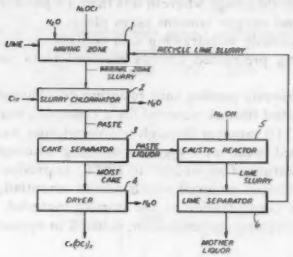
A. admixing lime, alkali metal hypochlorite and water in a mixing zone to form a mixing zone slurry,

B. reacting said mixing zone slurry with chlorine to form a paste comprised of

1. solid calcium hypochlorite dihydrate particles suspended in

2. a paste liquor comprised of an aqueous solution of

a. alkali metal chloride, and



b. dissolved calcium hypochlorite,

C. continuously withdrawing a portion of said paste and separating it into

1. said paste liquor, and

2. a moist cake of said solid calcium hypochlorite dihydrate particles,

D. reacting said paste liquor with a hydroxide of an alkali metal to form a slurry of precipitated lime in a mother liquor predominating in alkali metal hypochlorite and alkali metal chloride, and

E. recycling said precipitated lime to said mixing zone.

3,954,949
PROCESS FOR MAKING OXYGEN DIFLUORIDE

Henry Frankel, Raritan, and James S. MacKenzie, Parsippany Troy Hills, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 3, 1962, Ser. No. 193,649
Int. Cl.² C01B *11/24*
U.S. Cl. 423—489 **8 Claims**

1. The process for making oxygen difluoride which comprises subjecting alkali metal dioxide in a reaction zone, at temperature substantially in the range of 20°–150° C., to the action of elemental fluorine to effect reaction of fluorine with the alkali metal dioxide to form oxygen difluoride, and recovering oxygen difluoride.

3,954,950
PRODUCTION OF HIGH TENACITY GRAPHITIC FIBROUS MATERIALS

Michael J. Ram, West Orange; Arnold J. Rosenthal, Whippany, both of N.J., and Charles M. Clarke, Texas City, Tex., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 17,832, March 9, 1970, Pat. No. 3,775,520. This application Apr. 25, 1973, Ser. No. 354,469
The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.
Int. Cl.² C01B *31/07*
U.S. Cl. 423—447 **12 Claims**

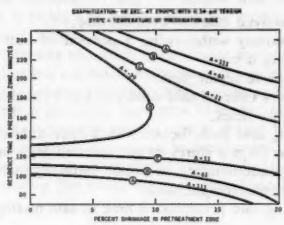
1. An improved process for the conversion of a drawn acrylic fibrous material having an inherent tendency to shrink in length when heated at about 170° to 220°C. selected from the group consisting of an acrylonitrile homopolymer and acrylonitrile copolymers which contain at least about 95 mol per cent of acrylonitrile units and up to about 5 mol per cent of one or more monovinyl units copolymerized therewith selected from the group consisting of styrene, methyl acrylate, methyl methacrylate, vinyl acetate, vinyl chloride, vinylidene

chloride, and vinyl pyridine to a high strength graphitic fibrous material comprising:

a. continuously passing a continuous length of said acrylic fibrous material for a residence time of about 90 to 900 seconds through a pretreatment heating zone provided with a gaseous atmosphere consisting essentially of an inert gas or air at a temperature of about 170° to 220°C. while under a longitudinal tension sufficient to permit up to about a 20 per cent reduction in length brought about through shrinkage wherein less than a 1 per cent increase in bound oxygen content takes place,

b. continuously withdrawing said continuous length of the resulting pretreated fibrous material from said heating zone,

c. continuously passing said resulting continuous length of pretreated fibrous material for a residence time of about 90 to 210 minutes through a preoxidation heating zone provided with an oxygen-containing atmosphere at a temperature of about 260° to 290°C. to produce a preoxidized fibrous material which retains essentially the same fibrous configuration as the starting material, is capable of undergoing carbonization, is black in appearance, and



is non-burning when subjected to an ordinary match flame, and

d. continuously passing a continuous length of said resulting preoxidized fibrous material while under a longitudinal tension of about 0.3 to 0.5 grams per denier through a carbonization/graphitization heating zone provided with an inert atmosphere and a temperature gradient in which said fibrous material is raised within a period of about 20 to about 300 seconds from about 800°C. to a temperature of about 1600° C. to form a continuous length of carbonized fibrous material, and in which said carbonized fibrous material is subsequently raised from 1600°C. to a temperature within the range of about 2400° to about 3100°C. within a period of about 3 to 300 seconds where it is maintained for about 10 seconds to about 200 seconds to form a continuous length of graphitic fibrous material; with said preoxidized fibrous material being supplied to said carbonization/graphitization heating zone in an anhydrous form;

said steps (a) and (c) being conducted in accordance with the formula:

$$A = 3X_2(12X_2 + 8X_3 + 7X_4) + 17X_3 + 10X_4,$$

where

$$X_2 = \frac{\text{Residence Time in Preoxidation Zone in Minutes-137}}{33}$$

$$X_3 = \frac{\text{Temperature of Preoxidation Zone in °C. - 277.5}}{7.5}$$

$$X_4 = \frac{\text{Per Cent Shrinkage in Pretreatment Zone - 12.}}{2.2}$$

and where A is equal to or less than 111.

3,954,951

PREPARATION OF RED AMORPHOUS SELENIUM

David Alan Buckley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 6, 1974, Ser. No. 495,242
Int. Cl.² C01B 19/00
U.S. Cl. 423—510 5 Claims

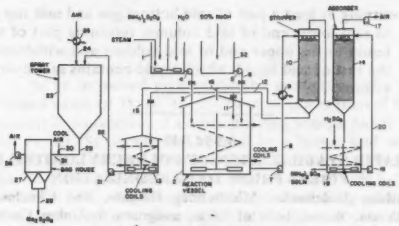
1. A process for producing stable red amorphous selenium in particles of less than about 5 microns which comprises precipitating selenious acid with hydrazine from a solution thereof in methanol or ethanol containing not more than about 50% by weight water at a temperature between about −20°C. and the freezing point of the solution and maintaining the resulting precipitate at a temperature of about −13° to about −3°C. until it is red.

3,954,952

CONTINUOUS CHEMICAL PROCESS FOR THE MANUFACTURE OF SODIUM AND POTASSIUM PEROXYDISULFATE

Richard E. Hall, Trenton; Sushil K. Bhalla, Princeton, and Michael J. McCarthy, Fanwood, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 24, 1975, Ser. No. 560,762
Int. Cl.² C01B 15/08
U.S. Cl. 423—513 9 Claims



FLOW DIAGRAM FOR THE MANUFACTURE OF SODIUM PERSULFATE (EXAMPLES I-4)

1. In the production of an alkali metal peroxydisulfate, in an aqueous medium, by the reaction of ammonium peroxydisulfate and a hydroxide of sodium or potassium at a temperature of 0° to 45°C, the improvement which comprises continuously mixing ammonium peroxydisulfate and an alkali metal hydroxide together in substantially stoichiometric proportions at a temperature of about 15° to 45°C, pH in the range of 11 to 13, maintaining the ammonia concentration in the reaction medium below 6 weight percent based on the weight of the reaction medium, by removing ammonia by passing air or an inert gas through the reaction solution, and recovering the product.

3,954,953

ENERGY CONSERVING PROCESS FOR MANUFACTURING FERRIC SULFATE

William A. Satterwhite, Englishtown, and Robert M. Leach, Hightstown, both of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed July 31, 1974, Ser. No. 493,285
Int. Cl.² C01G 41/14
U.S. Cl. 423—558 13 Claims

1. A continuous, process for manufacturing ferric sulfate without protracted curing periods which comprises (a) converting a substantial portion of the iron in a reaction mixture while in an aqueous phase to a ferric sulfate-containing slurry, wherein the reaction mixture comprises (1) a sulfuric acid having a concentration of at least 50% and in an amount ranging from about 30 to 80% of the total acid employed in the process and (2) a slurry consisting essentially of iron oxide comprised predominantly of ferric oxide and a sufficient amount of water to maintain the total iron content of the

mixture during the aqueous phase at between about 18 and 25%, (b) agglomerating the ferric sulfate-containing slurry and dispersing on the agglomerates formed the remaining 20 to about 70% sulfuric acid, and (c) drying and converting substantially all the unreacted iron oxide of the said agglomerates to ferric sulfate.

3,954,954

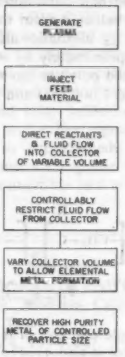
PLASMA METHOD AND APPARATUS FOR CARRYING OUT HIGH TEMPERATURE CHEMICAL REACTIONS

Robert D. Davis, Costa Mesa; Theodore N. Meyer, Laguna Beach, and Roy L. Blizzard, Huntington Beach, all of Calif., assignors to Plasmachem, Inc., Santa Ana, Calif.

Division of Ser. No. 342,699, March 19, 1973, Pat. No. 3,840,750, which is a continuation-in-part of Ser. No. 303,707, Nov. 6, 1972, abandoned, which is a division of Ser. No. 125,589, March 18, 1971, Pat. No. 3,738,824. This application Jan. 2, 1974, Ser. No. 430,228

Int. Cl.[2] C01G *33/00*, *35/00*, *39/00*; B01K *1/00*

U.S. Cl. 423—492 5 Claims


GENERATE PLASMA
INJECT FEED MATERIAL
DIRECT REACTANTS & FLUID FLOW INTO COLLECTOR OF VARIABLE VOLUME
CONTROLLABLY RESTRICT FLUID FLOW FROM COLLECTOR
VARY COLLECTOR VOLUME TO ALLOW ELEMENTAL METAL FORMATION
RECOVER HIGH PURITY METAL OF CONTROLLED PARTICLE SIZE

1. A process for halogenating refractory metal oxides comprising:

introducing a high temperature electric arc plasma stream into a confined reaction zone maintained at or slightly above atmospheric pressure,

heating the reaction zone to a temperature between approximately 1800° and 5000° K,

introducing the oxide and halogenating agent into said confined reaction zone downstream of the anode used in forming said arc,

passing the reaction products from said confined reaction zone through a restricted passageway into a collection zone, and

maintaining a pressure differential of approximately 0.5 to 5 psig between said reaction zone and said collection zone by varying the size of said restricted passageway during the course of the reaction.

3,954,955

PROCESS FOR WORKING UP THE WASH SOLUTION OBTAINED IN THE WASHING OF SO_2-CONTAINING OFF-GASES

Herbert Furkert, Grosskonigsdorf, Germany, assignor to Davy Powergas GmbH, Cologne-Braunsfeld, Germany

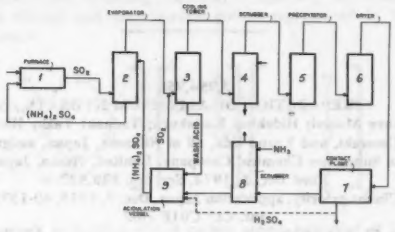
Continuation-in-part of Ser. No. 228,258, Feb. 22, 1972, Pat. No. 3,795,731. This application Aug. 30, 1972, Ser. No. 284,709

Claims priority, application Germany, Aug. 31, 1971, 2143444

The portion of the term of this patent subsequent to Mar. 5, 1991, has been disclaimed.

Int. Cl.[2] C01B *17/60*, *17/50*

U.S. Cl. 423—541 A 8 Claims



1. In a process which comprises scrubbing an SO_2-containing gas with an aqueous scrubbing solution to which ammonia is added to form ammonium sulfite and ammonium bisulfite as reaction products, adding to said sulfite and bisulfite solution a stoichiometric amount of sulfuric acid required for the liberation of all SO_2 from said reaction products to form SO_2 and a neutral aqueous solution of ammonium sulfate, concentrating the resultant neutral aqueous ammonium sulfate by evaporation and splitting the concentrated aqueous ammonium sulfate at a temperature of 900°–1250°C in a combustion chamber burning a carbon or sulfur containing fuel in the presence of sufficient oxygen to maintain an oxygen content of 1–10 vol. % in the gas exiting from the combustion chamber to form a hot split gas consisting essentially of sulfur dioxide, molecular nitrogen, molecular oxygen and water vapor, the improvement which comprises: heat exchanging said hot split gas with said aqueous ammonium sulfate to evaporate said aqueous ammonium sulfate to a concentrate having a water content of less than 55 wt. %, thereby cooling said hot split gas.

3,954,956

TERNARY OXIDES WITH THE CUBIC $KSbO_3$ CRYSTAL STRUCTURE

Arthur William Sleight, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 424,895, Dec. 14, 1973, abandoned. This application Jan. 31, 1975, Ser. No. 546,179

Int. Cl.[2] C01G *55/00*

U.S. Cl. 423—593 6 Claims

1. An oxide of cubic $KSbO_3$ crystal structure selecteed from the group consisting of $BaIr_2O_6$, $BaOs_2O_6$, $SrIr_2O_6$, $SrOs_2O_6$ and $SrRu_2O_6$.

3,954,957

PRODUCTION OF ALUMINA MONOHYDRATE PIGMENT

James J. Koenig, Belleville, Ill., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 24, 1975, Ser. No. 552,642
Int. Cl.[2] C01F 7/02
U.S. Cl. 423—626 5 Claims

1. A process for the preparation of uniform size alumina monohydrate crystals having optically useful properties as pigments in paper, paint, and ink which comprises:

a. grinding Bayer trihydrate to a median particle size of 1–3 microns;

b. digesting the ground trihydrate at a temperature of at least 180°C and at a pressure of from 130 to 565 psi for a period of at least 30 seconds in the presence of from 0.003–0.03 moles of mineral acid per mole of hydrate; and

c. recovering a monohydrate product having a uniform particle size and substantially in the range from 0.2 to 0.7 microns sufficiently large to be useful as a pigment.

3,954,958

PREPARATION OF ALUMINUM HYDRATE

Atsuro Matsui; Hidekimi Kadokura; Tadaaki Yako; Hiroshi Umezaki, and Kazuo Iida, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 5, 1974, Ser. No. 529,937
Claims priority, application Japan, Dec. 7, 1973, 48-137934
Int. Cl.[2] C01F 7/02
U.S. Cl. 423—630 17 Claims

1. A process for producing a powdery alumina hydrate from an alkylaluminum compound by hydrolysis by water, which comprises

reacting an alkylaluminum compound having the general formula:

wherein R_1 represents a hydrogen atom, alkyl group having 1 to 8 carbon atoms or alkoxy group having 1 to 6 carbon atoms, R_2 and R_3 represent alkyl groups having 1 to 8 carbon atoms with an ether to form an ether complex compound,

said ether being an ether compound having a boiling point of not more than 175°C and an ability to form a coordination compound with an alkylaluminum compound;

partially hydrolyzing the ether complex compound in the presence of a non-reactive solvent selected from the group consisting of ethers having a boiling point of not higher than 175°C as were capable of use in the partial hydrolysis, aliphatic hydrocarbons, alicyclic hydrocarbons, aromatic hydrocarbons and mixtures thereof at a temperature of not higher than about 150°C with stirring, while preventing precipitation of alumina hydrate until at least 0.8 moles of water reacts with one mole of the alkylaluminum compound, thereby forming polyaluminoxane;

completely hydrolyzing the formed polyaluminoxane at a concentration of not more than about 3.0 gram-atoms as aluminum per liter of said non-reactive solvent at a temperature of from about 10° to about 150°C with stirring, thereby completely hydrolyzing ultimately 1 mole of the feed alkylaluminum compound with 2 to 10 moles of water to precipitate alumina hydrate; and

separating the resulting alumina hydrate from said non-reactive solvent.

3,954,959

ORAL DRUG PREPARATIONS

Arne Martinus Pedersen, Vanlose, Denmark, assignor to A/S Alfred Benzon, Copenhagen, Denmark

Continuation-in-part of Ser. No. 453,032, March 20, 1974. This application Aug. 27, 1975, Ser. No. 608,230
Int. Cl.[2] A61K 9/22, 9/32
U.S. Cl. 424—21 1 Claim

1. An oral drug preparation having a protracted effect and a substantially constant rate of release of the drug, comprising an admixture, of a drug and an effective amount of a buffer acid, buffer acid salts, and mixtures thereof, in the form of small spheroidal particles of 0.1 to 5 mm diameter, said particles having a coating thereon of a film-forming acrylic polymer drug-diffusing dragee lacquer, allowing for diffusion of the stomach and intestinal juices through the coating, but not being soluble in said juices.

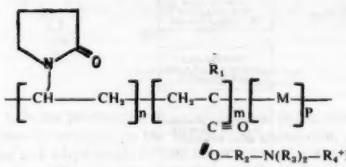
3,954,960

HAIR AND SIMILAR COSMETIC PREPARATIONS CONTAINING A QUATERNIZED COPOLYMER OF VINYL PYRROLIDONE

Kent J. Valan, Easton, Pa., assignor to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 7,249, Jan. 30, 1970, abandoned. This application June 29, 1973, Ser. No. 374,926
Int. Cl.[2] A61K 7/00
U.S. Cl. 424—47 13 Claims

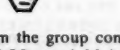
1. A hair-setting and hair-conditioning composition comprising a solvent base selected from the group consisting of water, monohydric C_{2-3} aliphatic alcohols, and mixtures thereof, containing approximately by weight 0.1 to 35% of a film-forming quaternized polymer having a molecular weight ranging from 15,000 to 1,000,000 and having the formula:



wherein n is 40–90 mole percent, m is 5–40 mole percent, p is from 0–50 mole percent and $n+m+p = 100$ mole percent;

R_1 is selected from the group consisting of H and CH_3;

R_2 is C_xH_{2x} where $x = 2$–18; R_3 is selected from the group consisting of CH_3 and C_2H_5; R_4 is selected from the group consisting of CH_3, C_2H_5, and



;

X is selected from the group consisting of Cl, Br, I, SO_4, HSO_4, and CH_3SO_3; and M is a monovinyl monomer different from and copolymerizable with the other monomeric units of said polymer.

3,954,961

DENTAL POLISHING CREAMS

Daniel Colodney, Somerville, and Martin Cordon, Highland Park, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 301,935, Oct. 30, 1972, abandoned. This application Apr. 30, 1973, Ser. No. 355,372
Int. Cl.[2] A61K 7/16
U.S. Cl. 424—49 5 Claims

1. A dental cream comprising a dental vehicle having dispersed therein an amount of alpha-alumina flakes within the

range of 0.1 to 5% and an amount of iridescent flakes within the range of 0.1 to 5%, said iridescent flakes being selected from the group consisting of mother of pearl and coated mica flakes, the coating on the mica having an index of refraction different from that of mica, said alpha-alumina having an average particle diameter of less than 20 microns and thicknesses of less than about 3 microns.

3,954,962

ORAL HYGIENE PRODUCT

Samuel B. Prussin, Los Angeles, Calif., assignor to Alan R. Tripp; Samuel Grubstein; Eugene F. Whelan; E. R. Finnis and Samuel Prussin, all of New York, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,779
Int. Cl.² A61K *7/16*
U.S. Cl. 424—49 **8 Claims**

1. An essentially non-aqueous oral hygiene product comprising (a) at least 30% by weight of total product of a suitable alcohol; (b) a first viscosity adjuster selected from the group consisting of polyvinylpyrrolidone having a molecular weight of 10,000 to 360,000, a low molecular weight, partially hydrolyzed, cold water soluble, methyl cellulose, hydroxy propyl cellulose, a high molecular weight carboxy vinyl polymer, non-ionic polymers of ethylene oxide, and a block polymer polyol having a molecular weight of from 1,000 to 15,500; (c) a second viscosity adjuster selected from the group consisting of glycerin, propylene glycol, 1,3 butylene glycol, sorbitol, pantothenyl alcohol, polyethylene glycols ranging in average molecular weights from 150 – 2000, and ethylene oxide condensates of between 20 and 1,000 ethylene oxide groups of fatty acids with 12 to 18 carbon atom; and (d) a suitable detergent; said first and second viscosity adjusters being present in amounts and relative proportions sufficient to give said product a viscosity and body sufficient to hold the desired amount of detergent and other ingredients which may be added and to adhere to a toothbrush; whereby the oral hygiene product is a dentifrice capable of effective debris removal and is readily convertible to a mouthwash by the addition of water.

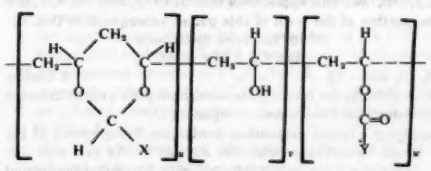
3,954,963

AIR REODORANT COMPOSITIONS

Jerome G. Kuderna, Jr., Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 4, 1974, Ser. No. 448,126
Int. Cl.² A61L *9/00, 9/04, 13/00*
U.S. Cl. 424—76 **11 Claims**

1. A gelled slow-release air reodorant composition comprising (1) as a fragrance from about 5 to about 90% by weight of an acyclic or monocyclic terpene aldehyde, ketone, or alcohol in gelling interaction with (2) from about 10 to about 40% by weight of a polyvinyl acetal resin compatible with said terpene, said polyvinyl acetal resin having a molecular weight of from about 30,000 to about 1,000,000 and consisting essentially of repeating vinyl acetal, vinyl alcohol and vinyl acetate groups represented by the structure:



wherein X is H, alkyl of 1–8 carbon atoms, haloalkyl of 1–8 carbon atoms, hydroxyalkyl of 1–8 carbon atoms, alkenyl of 2–8 carbon atoms, halogen or hydroxyl; Y is alkyl of 1–9 carbon atoms; and *u*, *v* and *w* indicate the relative percent by weight of the respective vinyl acetal, vinyl alcohol, and vinyl ester groupings of the resin, and wherein *u* is from about 30 to about 90, *v* is from about 15 to about 25 and *w* is from 0 to about 30, and the sum of $u + v + w$ equals 100.

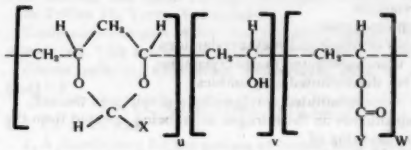
3,954,964

AIR REODORANT COMPOSITIONS

Jerome G. Kuderna, Jr., Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 4, 1974, Ser. No. 448,127
Int. Cl.² A61L *9/00, 9/04, 13/00*
U.S. Cl. 424—76 **9 Claims**

1. A gelled slow-release air reodorant composition comprising (1) as a fragrance from about 5 to about 90% by weight of a C_1 to C_8 alkyl salicylate in gelling interaction with (2) from about 10 to about 40% by weight of a polyvinyl acetal resin compatible with said salicylate, said polyvinyl acetal resin having a molecular weight of from about 30,000 to about 1,000,000 and consisting essentially of repeating vinyl acetal, vinyl alcohol and vinyl acetate groups represented by the structure:



wherein X is H, alkyl of 1–8 carbon atoms, haloalkyl of 1–8 carbon atoms, hydroxyalkyl of 1 8 carbon atoms, alkenyl of 2–8 carbon atoms, halogen or hydroxyl; Y is alkyl of 1–9 carbon atoms; and *u*, *v* and *w* indicate the relative percent by weight of the respective vinyl acetal, vinyl alcohol, and vinyl ester groupings of the resin, and wherein *u* is from about 30 to about 90, *v* is from about 15 to about 25 and *w* is from 0 to about 30, and the sum of $u + v + w$ equals 100.

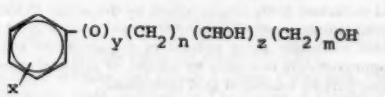
3,954,965

COMPOSITION AND METHOD OF STERILIZING SOFT CONTACT LENSES AND METHOD FOR PREVENTING FORMATION OF PROTEINACEOUS DEPOSITS THEREON

Malcolm P. Boghosian, Long Beach; Milagros V. Blanco, Villa Park, and Hampar L. Karageozian, Laguna Hills all of Calif., assignors to Allergan Pharmaceuticals, Irvine, Calif.

Filed Dec. 29, 1972, Ser. No. 319,483
Int. Cl.² A61K *31/78, 31/045, 31/085;* **A61L** *13/00*
U.S. Cl. 424—81 **8 Claims**

1. A composition for preventing the formation of proteinaceous deposits on plastic hydrophilic soft contact lenses and for sterilizing the same comprising an aqueous, non-toxic, substantially isotonic solution containing as active ingredients, an effective amount of a sterilizing compound having the formula:



wherein *y* is 0 or 1, *z* is 0 or 1, *n* is from 0–3, *m* is from 0–3, and *n* and *m* are not both 0, and *x* is selected from the group consisting of H and Cl, and an effective amount of a non-toxic protein reacting compound to substantially prevent the accumulation of deposits on the lens.

3,954,966

INFUSION SOLUTIONS AND METHOD OF MANUFACTURING SAME

Drahoslav Lim, Stanford, Calif.; Ladislav Sprincl, Stodulky-Haje, Czechoslovakia; Jindrich Kopecek, Czechoslovakia, and Jiri Vacik, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation of Ser. No. 228,269, Feb. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 147,680, May 27, 1971, abandoned. This application Mar. 20, 1974, Ser. No. 453,082

Claims priority, application Czechoslovakia, June 8, 1970, 3992-70

Int. Cl.[2] A61K *31/78*

U.S. Cl. 424—81 **13 Claims**

1. A method for extending blood in a subject requiring such treatment which comprises infusing into said subject, in an amount necessary to replace lost blood, a solution having a viscosity of about 1 to 3 centipoise of a physiologically acceptable aqueous solvent and water soluble polymer formed from monomers selected from the group consisting of mono-, di-, or tri- ethylene glycol esters of methacrylic and acrylic acid,

glycerine methacrylate,

acrylamide,

methacrylamide,

N, N - disubstituted methacrylamides,

N - monosubstituted methacrylamides,

N, N - disubstituted acrylamides,

N - monosubstituted acrylamides and mixtures thereof,

the substituents on the nitrogen atom being selected from the group consisting of

lower alkyl radicals containing 1 to 4 carbon atoms, hydroxyalkyl and dihydroxyalkyl radicals containing 1 to 6 carbon atoms.

3,954,967

METHOD OF PRODUCING MICROCOLLOIDAL AQUEOUS EMULSIONS OF UNSATURATED ORGANIC INSECTICIDAL COMPOUNDS

John T. Urton, Prairie Village, Kans., assignor to Vanguard Chemical Company, Inc., Kansas City, Mo.

Division of Ser. No. 169,248, Aug. 5, 1971, Pat. No. 3,813,345. This application Apr. 10, 1974, Ser. No. 459,673

Int. Cl.[2] A61K *31/78;* **A01N** *9/20, 9/30*

U.S. Cl. 424—81 **14 Claims**

1. A method of reducing the micelle size of an aqueous emulsion of an unsaturated organic compound having insecticidal properties, said compound being characterized by solubility in an organic polar solvent, and an absence of the elements iron, copper, zinc and phosphorous, said method comprising the steps of:

preparing the internal phase of said emulsion by adding a quantity of said compound along with a quantity of surfactant to an organic polar solvent,

said compound being present in a quantity such that the volume of the compound relative to the volume of the subsequently formed emulsion is no more than approximately 4%, and said solvent being present in a quantity such that the volume of the solvent relative to the volume of the subsequently formed emulsion is from 10% to 25%,

said surfactant being characterized by the ability to form a microemulsion which is soluble in said polar solvent and said surfactant being present in a quantity of at least approximately two parts by volume of said surfactant to one part by volume of said compound;

diluting said internal phase to at least approximately 70% by volume water to form said emulsion;

adding to said emulsion a quantity of a water soluble resinous compound to comprise at least approximately 0.005% by weight of the subsequently formed microemulsion characterized by the presence of a high number of positive ion accepting sites in each molecule of the resinous compound, there being at least one site in each repeating monomer of the molecule;

equilibrating said resinous compound with a stoichiometric quantity of a compound capable of donating positive ions to said sites to cause the latter to assume a charge of the same sign as the sign of the charge on the emulsion micelle while maintaining a substantially constant pH in said emulsion;

whereby the increased charge in the emulsion from the molecules of the resinous compound results in division of the emulsion micelles into micelles of a smaller size to form a microemulsion; and

incorporating in the emulsion a chelating agent for the calcium ions present in the basil membrane of an insect to thereby increase the penetrability of said organic compound through said insect.

3,954,968

COMPOSITION FOR ATTRACTING THE COTTON BOLL WEEVIL

Gerald H. McKibben, Starkville, Miss., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 27, 1975, Ser. No. 554,056

Int. Cl.[2] A01N *17/14*

U.S. Cl. 424—84 **1 Claim**

1. An improved species-specific composition for attracting the boll weevil, *Anthonomus grandis* Boheman, the improvement comprising adding a synthetic boll weevil attractant (grandlure) to a gelled emulsion to prolong activity in the field, said composition containing:

a. 0.2 parts by weight of grandlure synthetic boll weevil pheromone,

b. about from 5 to 20 parts by weight of crude cottonseed oil thickened with 6% by weight of pyrogenic silica,

c. about 5 parts by weight of glycerol,

d. about 3.5 parts by weight of cellulose and polysaccharide gum type organic thickener selected from the group consisting of hydroxy ethyl cellulose and locust bean gum,

e. about 0.25 parts by weight of a preservative consisting of equal parts of potassium sorbate and the methyl ester of parahydroxybenzoic acid,

f. about 5 parts by weight of an emulsifying agent consisting of a mixture of polyoxyethylene sorbitan monooleate and sorbitan monooleate, and

g. sufficient water to give a total of 100 parts by weight.

3,954,969

PRODUCT AND PROCESS FOR TREATING AND RESTORING HONEYCOMBS INFECTED WITH AMERICAN FOULBROOD DISEASE

Charles P. Reinert, Rte. 1, Box 149, Garvin, Minn. 56132, and Samuel F. Tutt, 1603 Baker St. Apt. 8, Laramie, Wyo. 82070

Continuation-in-part of Ser. No. 226,196, Feb. 14, 1972, Pat. No. 3,775,786. This application Dec. 3, 1973, Ser. No. 421,359

The portion of the term of this patent subsequent to Dec. 4, 1990, has been disclaimed.

Int. Cl. A01n *15/00*

U.S. Cl. 424—93 **5 Claims**

1. A process for treating diseased honeybee combs infected with American Foulbrood, comprising:

applying a liquid suspension containing living spores of the mold *Penicillium waksmani* Zaleski to the cell wall surfaces of a honeycomb infected with American Foulbrood scales,

allowing the honeycomb to remain at a temperature of about 65° to 75°F and at a relative humidity of about 85% for a period of time to permit sufficient growth of the mold, *Penicillium waksmani* Zaleski to cover the comb including the cell walls thereof,

then placing the comb in a well populated beehive whereby the American Foulbrood scales and dried mold *Penicillium waksmani* Zaleski are removed from the honeycomb cells by the bees.

3,954,970

ACTINOMYCIN COMPLEX FROM MICROMONOSPORA

Marvin J. Weinstein; Gerald H. Wagman, both of East Brunswick; Joseph A. Marquez, Montclair, and Paul D. Watkins, Verona, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed May 24, 1974, Ser. No. 473,095

Int. Cl.² A61K *35/00*

U.S. Cl. 424—115 **3 Claims**

1. A process for preparing Antibiotic 70591 complex which comprises cultivating *Micromonospora floridensis* NRRL 8020 under submerged aerobic conditions in an aqueous medium containing assimilable sources of nutrient materials until a complex having substantial antibacterial activity is produced and isolating the antibiotic 70591 complex from the medium.

3,954,971

METHOD OF TREATING PROSTATIC HYPERTROPHY WITH N-ACETYL CANDICIDIN

Harry W. Gordon, Bronx, N.Y., assignor to Schmid Laboratories, Inc., Little Falls, N.J.

Division of Ser. No. 313,568, Dec. 8, 1972, Pat. No. 3,843,785, which is a continuation of Ser. No. 194,052, Oct. 29, 1971, Pat. No. 3,721,734, which is a division of Ser. No. 70,509, Sept. 8, 1970, Pat. No. 3,714,346, which is a continuation of Ser. No. 623,847, March 17, 1967, Pat. No. 3,584,118, which is a continuation-in-part of Ser. No. 544,712, April 25, 1966, abandoned. This application Jan. 11, 1974, Ser. No. 432,501

Int. Cl.² A61K *35/00*

U.S. Cl. 424—117 **3 Claims**

1. Process for the treatment of prostatic hypertrophy in a large mammal afflicted with prostatic hypertrophy which comprises orally administering to said mammal an effective dose for treating prostatic hypertrophy of a composition comprising N-acetyl candicidin.

3,954,972

ANTIBIOTIC A-26771 FACTOR

Karl H. Michel, and Marvin M. Hoehn, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 298,053, Oct. 16, 1972, Pat. No. 3,883,561. This application Jan. 17, 1975, Ser. No. 541,907

Int. Cl.² C12D *9/22*; **C07G** *11/00*; **C07D** *513/08*

U.S. Cl. 424—117 **1 Claim**

1. The antibiotic A-26771 factor C which is a colorless crystalline compound when crystallized from acetone-etherpentane, which is soluble in common polar organic solvents such as ethyl acetate, ethanol, methanol, chloroform, and the like, but is relatively insoluble in water; and which has:

a. a melting point of about 130° C.;

b. a molecular weight of 388, as determined by mass spectrometry;

c. an approximate elemental composition of 43.12% carbon, 4.21% hydrogen, 7.02% nitrogen, and 32.5% sulfur;

d. an empirical formula of $C_{18}H_{16}N_2O_3S_4$

e. a specific rotation of $[\alpha]_D^{25}$ −187 (c = 0.04, methanol)

f. an infrared absorption spectrum in chloroform as shown in FIG. 3;

g. the following observed absorption maximum in acidic ethanol in its ultraviolet spectrum:

λ max. 275 mμ

h. a nuclear magnetic resonance spectrum in chloroform D_2O with the following characteristics: δ 7.26 (5H, multiplet); 4.26, 3.85 (2H, AB, quartet, J = 13 Hz); 4.05, 3.25 (2H, AB, quartet, J = 15 Hz); 3.13 (3H, singlet); and 3.07 ppm (3H, singlet).

3,954,973

ALKYLATED DERIVATIVES OF ANTIBIOTIC AV290

Joseph John Hlavka, Tuxedo, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 409,506, Oct. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 259,188, June 2, 1972, abandoned. This application Jan. 3, 1975, Ser. No. 538,629

Int. Cl.² A61K *35/00*

U.S. Cl. 424—118 **3 Claims**

1. The product of the reaction of antibiotic AV290 with methyl bromide, a compound which

a. is effective in inhibiting the growth of bacteria; and in its essentially pure crystalline form

b. has the following elemental analysis (percent): C, 45.96; H, 5.00; N, 5.29; Cl, 3.08; Br, 9.53; and

c. has a characteristic infrared absorption spectrum as shown in FIG. 1 of the drawings.

3,954,974

DISINFECTANT FOR THE SURFACE OF HUMAN BODY PARTS CONTAINING HYDROGEN PEROXIDE

Paul Herzog, and Karin Herzog-Thomander, both of Avenue de Rolliez 10, Vevey, Switzerland

Continuation-in-part of Ser. No. 365,681, May 31, 1973, abandoned. This application July 30, 1974, Ser. No. 493,147

Claims priority, application Switzerland, June 9, 1972, 8641/72

Int. Cl.² A61K *33/40*; **A61L** *13/00*

U.S. Cl. 424—130 **3 Claims**

1. A disinfectant for the surface of human body parts, consisting essentially of an oil-in-water emulsion having a continuous aqueous phase containing an amount of hydrogenperoxide effective to disinfect human body parts upon contact, the oil phase being the dispersed phase of the emulsion and containing by weight, from 80 to 230 parts of glycerol monostearate, from 80 to 320 parts of paraffin oil, from 80 to 320 parts of cetyl alcohol, from 150 to 600 parts of petroleum jelly and from 10 to 200 parts of a polyoxyethylene derivative of anhydrosorbitol partially esterified with a higher fatty acid, and wherein the total emulsion comprises per liter of said oil phase, a water phase containing from 3 to 7 liters of water and from 100 to 450 g of hydrogen peroxide.

3,954,975

SALTS OF ACTH-PEPTIDES AND PROCESSES FOR THEIR MANUFACTURE

Leo Geller, Riehen, and Werner Rittel, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 331,148, Feb. 9, 1973, abandoned. This application July 10, 1974, Ser. No. 487,093

Claims priority, application Switzerland, Feb. 17, 1972, 2300/72

Int. Cl.² A61K *37/40*; **C07C** *103/52*

U.S. Cl. 424—179 **13 Claims**

1. An injectable pharmaceutical composition comprising an effective amount of an acid addition salt of an ACTH-peptide, said salt being derived from a saturated or unsaturated fatty acid having from 12 to 36 carbon atoms together with a carrier for suspension or solution.

3,954,976

PHARMACEUTICAL COMPOSITIONS FOR INHIBITING ABSORPTION OF CHOLESTEROL

Fred Hugh Mattson, and Robert Anthony Volpenhein, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 14, 1973, Ser. No. 425,010

Int. Cl.² A01N *9/00*

U.S. Cl. 424—180 **9 Claims**

1. A pharmaceutical composition in effective unit dosage amounts for inhibiting the absorption of cholesterol compris-

ing from about 0.1 gram to about 5 grams of a polyol fatty acid ester having at least four fatty acid esters groups, wherein the polyol is selected from the group consisting of sugars and sugar alcohols containing from four to eight hydroxyl groups and wherein each fatty acid group has from about eight to about 22 carbon atoms.

3,954,977

INSECTICIDAL PYRETHROID COMPOSITIONS HAVING INCREASED EFFICACY

Harold E. Rife, Millington, N.J., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 274,556, July 24, 1972, abandoned. This application Feb. 19, 1974, Ser. No. 443,583
Int. Cl.² A01N *9/08*
U.S. Cl. 424—188 **2 Claims**

1. An insecticidal composition comprising (a) about 0.1 to about 1.5% to weight of a pyrethroid, (b) about 0.5 to about 15% by weight of piperonyl butoxide, (c) about 0.2 to about 2.5% by weight of a non-ionic water soluble emulsifier, wherein said emulsifier is a mixture of sorbide dioleate and a polyglycerol ester of oleic acid, (d) about 0.5 to about 8% by weight of N,N-dimethyloleamide, and about 70 to about 98% by weight of a aqueous carrier for said pyrethroid the weight ratio of said pyrethroid to said piperonyl butoxide being about 1:2.5 to about 1:10 and the weight ratio of said N,N-dimethyloleamide to said pyrethroid being about 10:1 to about 1:2.

3,954,978

LINIMENT

Angeline R. Magolan, 1452 Elm St., Wyandotte, Mich. 48192

Continuation-in-part of Ser. No. 447,979, April 4, 1974, abandoned. This application Mar. 3, 1975, Ser. No. 554,973
Int. Cl.² A61K *35/78*
U.S. Cl. 424—195 **2 Claims**

1. A method of relieving pain by topically applying effective amounts of a pain relieving composition comprising an active extract of the roots of a plant selected from the group consisting of bluebell, harebell and bellflower, said extract being prepared by soaking cut up roots in isopropyl alcohol in a glass container for 1 year and straining the mixture of roots and alcohol to obtain the extract.

3,954,979

PROCESS FOR PREPARING STABILIZED YEAST AND COMPOSITIONS AND TABLETING COMPOSITION AND METHOD

Benton O. Bowman, Barrington, Ill., assignor to Ceres Products Company, Inc., Holland, Mich.

Continuation of Ser. No. 309,158, Nov. 24, 1972, abandoned. This application Nov. 18, 1974, Ser. No. 524,854
Int. Cl.² A61K *35/78*
U.S. Cl. 424—195 **10 Claims**

1. A process for preparing a stabilized yeast and vitamin concentrate composition having high activity in reducing the observable intoxicating effects of ethyl alcohol in human subjects which comprises:

a. admixing the vitamins thiamine, riboflavin and niacin in pre-determined ratios of 3 parts thiamine; 3 parts riboflavin; and 1 part niacin with an edible yeast cream having a yeast cell solids content of at least 10% to produce a homogeneous slurry;

b. pasteurizing the resulting slurry; and

c. dehydrating the slurry to reduce the moisture content to below about 8% under time and temperature conditions whereby the activity of the admixture is not impaired.

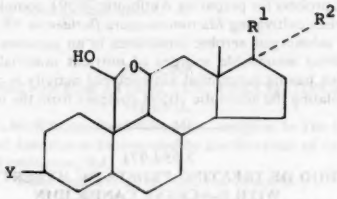
3,954,980

CHEMICAL COMPOUNDS

Derek Harold Richard Barton, c/o Department of Chemistry, Imperial College, London, S.W.7, England, and Robert H. Hesse, c/o Research Institute for Medicine and Chemistry Inc. 49 Amherst St., Cambridge, Mass. 02142

Continuation of Ser. No. 190,633, Oct. 19, 1971, abandoned. This application July 6, 1973, Ser. No. 376,961
Int. Cl.² C07J *71/00*
U.S. Cl. 424—241 **6 Claims**

1. A method of contraception whereby at least one steroid hemiacetal of the skeletal formula:



(where Y is a ketone oxygen atom or represents a grouping convertible thereto, R^1 is a group $COCH_2X$, where X is a hydrogen or halogen atom, and R^2 is a hydrogen atom or an acyloxy group or R^1 is a hydroxy group and R^2 is an aliphatic group which may carry one or more halogen atoms as substituents and where the 6β-, 9α- and 16-positions carry hydrogen atoms or substituents selected from the group consisting of a halogen atom or an alkyl group at the 6β-position, a halogen atom at the 9α-position, or a methyl or methylene group, a halogenated methyl or methylene group or a halogen atom at the 16-position) is administered orally to a human subject.

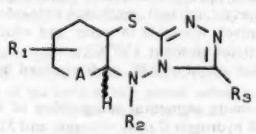
3,954,981

TRIAZOLOCYCLOALKYLHYDROTHIADIAZINE DERIVATIVES

William L. Albrecht, and Winton D. Jones, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Apr. 28, 1975, Ser. No. 571,940
Int. Cl.² C07D *285/20*, *285/22*
U.S. Cl. 424—246 **11 Claims**

1. A triazolocycloalkylhydrothiadiazine having the formula:



wherein

R_1 is selected from the group consisting of hydrogen and lower alkyl having from 1 to 4 carbon atoms;

R_2 is selected from the group consisting of hydrogen, acetyl, N-carbamoylacetic acid (ethyl ester), cinnamoyl and anilinocarbonyl;

R_3 is selected from the group consisting of hydrogen, alkyl having from 1 to 15 carbon atoms, trifluoromethyl, cycloalkyl having from 3 to 6 carbon atoms, phenyl, alkoxyalkyl having from 2 to 8 carbon atoms and phenoxyalkyl having from 7 to 10 carbon atoms;

A is a sigma bond or the radical $-(CH_2)_n-$ in which n is a whole integer of from 1 to 7, and the pharmaceutically acceptable acid addition salts thereof.

3,954,982

PHARMACEUTICAL COMPOSITIONS AND METHOD OF INHIBITING H-1 AND H-2 HISTAMINE RECEPTORS

James Whyte Black, Hemel Hempstead, and Michael Edward Parsons, St. Albans, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 349,151, April 9, 1973, Pat. No. 3,894,151. This application Apr. 16, 1975, Ser. No. 568,648
Claims priority, application United Kingdom, Apr. 20, 1972, 18301/72
Int. Cl.² A61K 31/54
U.S. Cl. 424—246 12 Claims

1. A pharmaceutical composition having H-1 and H-2 histamine receptor inhibiting activity which comprises about 30 mg. to about 250 mg. of an antihistamine, said antihistamine being a compound which inhibits those histamine receptors inhibited by mepyramine, about 50 mg. to about 500 mg. of an H-2 histamine receptor inhibitor, H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, and a pharmaceutically acceptable diluent or carrier, wherein said H-2 histamine receptor inhibitor is a compound selected from the group consisting of N-methyl-N'-[4-(2-thiazolyl)-butyl]thiourea, N-methyl-N'-[2-((4-bromo-3-isothiazolyl)-methylthio)ethyl]thiourea, S-(2-phenoxyethyl)-N-[3-(4-imidazolyl)-propyl]isothiourea, S-(p-chlorobenzyl)-N-[3-(4-imidazolyl)-propyl]isothiourea, S-ethyl-N-[3-(4-imidazolyl)propyl]isothiourea, S-[4-(4(5)-imidazolyl)butyl]-isothiourea, S-[2-(4(5)-imidazolyl)ethyl]isothiourea and N,N-dimethyl-S-[2-(4-(5)-imidazolyl)ethyl]isothiourea.

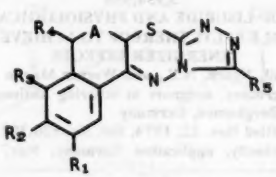
3,954,983

TRIAZOLOBENZOCYCLOALKYLTHIADIAZINE DERIVATIVES

William L. Albrecht, and Francis W. Sweet, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Apr. 28, 1975, Ser. No. 571,941
Int. Cl.² C07D 285/20
U.S. Cl. 424—246 10 Claims

1. A triazolobenzocycloalkylthiadiazine having the formula



wherein

R_1, R_2, and R_3 are each selected from the group consisting of hydrogen, lower alkyl having from 1 to 4 carbon atoms and lower alkoxy having from 1 to 4 carbon atoms;

R_4 is selected from the group consisting of hydrogen and lower alkyl having from 1 to 4 carbon atoms;

A is a sigma bond or the methylene radical;

R_5 is lower alkyl having from 1 to 4 carbon atoms;

and the pharmaceutically acceptable acid addition salts thereof.

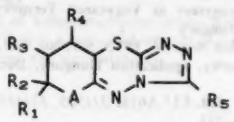
3,954,984

TRIAZOLOCYCLOALKYLTHIADIAZINE DERIVATIVES

William L. Albrecht, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed Apr. 28, 1975, Ser. No. 571,942
Int. Cl.² C07D 285/20, 285/22
U.S. Cl. 424—246 10 Claims

1. A triazolocycloalkylthiadiazine having the formula:



wherein

R_1, R_2 and R_3 are each selected from the group consisting of hydrogen and lower alkyl having from 1 to 4 carbon atoms;

R_4 is selected from the group consisting of hydrogen, lower alkyl having from 1 to 4 carbon atoms and oxo;

R_5 is selected from the group consisting of hydrogen, alkyl having from 1 to 15 carbon atoms, trifluoromethyl, cycloalkyl having from 3 to 6 carbon atoms, phenyl, alkoxyalkyl having from 2 to 8 carbon atoms and phenoxyalkyl having from 7 to 10 carbon atoms;

A is a sigma bond or the radical $-(CH_2)_n-$ in which *n* is a whole integer of from 1 to 7; and the pharmaceutically acceptable acid addition salts thereof.

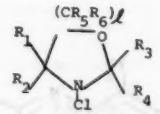
3,954,985

METHOD FOR INHIBITING BACTERIAL GROWTH WITH CERTAIN SELECTED 3-CHLORO-TETRAHYDRO-1,3-OXAZINES OR OXAZOLIDINES

Nicolae S. Bodor, and James J. Kaminski, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 456,744, April 1, 1974, Pat. No. 3,897,425. This application Apr. 10, 1975, Ser. No. 566,747
Int. Cl.² A01N 9/22
U.S. Cl. 424—248 11 Claims

1. A method for inhibiting bacterial growth which comprises treating said bacterial growth with an anti-bacterial effective amount of a compound of the formula:



wherein each of R_1 and R_2 which may be the same or different represents alkyl of from 1 to 20 carbon atoms; wherein each of R_5 and R_6 which may be the same or different, represents a hydrogen atom or alkyl of from 1 to 20 carbon atoms; and wherein each of R_3 and R_4 which may be the same or different represents alkyl of from 1 to 20 carbon atoms, $-(CH_2)_nX$, wherein *n* represents an integer of from 1 to 20 and wherein X represents a member selected from the group consisting of dimethylamino, diethylamino, trimethylammonium, triethylammonium, dimethylammonium, diethylammonium, $-COOR_7$, $-OOCR_8$ and $-OR_9$, wherein each of R_7 through R_9 respectively, represent a member selected from the group consisting of alkyl of from 1 to 5 carbon atoms and benzyl; and wherein *l* represents an integer of 1 or 2.

3,954,986

PHARMACEUTICAL COMPOSITION HAVING SYNERGISTIC ANALGETIC ACTIVITY

József Knoll; Zsuzsanna Fürst; Zoltán Mészáros; Péter Szentmiklósi; Ágoston Dávid; István Hermecz; Attila Mándi, all of Budapest; Rezsö Bognár; Sándor Makleit, both of Debrecen; Gyula Valovics, Tiszavasvari; László Szlávik, Tiszavasvari, and Sándor Nagy, Tiszavasvári, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT., Budapest, Hungary

Filed Nov. 14, 1973, Ser. No. 415,749

Claims priority, application Hungary, Dec. 19, 1972, CI 1322

Int. Cl.[2] A61K *31/505, 31/485*

U.S. Cl. 424—251 1 Claim

1. In an analgesic composition, the synergistic combination of 300 parts by weight of 1,6-dimethyl-3-carbethoxy-4-oxo-6,7,8,9-tetrahydro-homopyrimidazolium-methosulphate with substantially 45 to 60 parts by weight of azidocodeine.

3,954,987

2-ALKYL-4-SUBSTITUTED AMINO-QUINAZOLINES AND NITRATES THEREOF IN THE TREATMENT OF MYOCARDIAL SHOCK

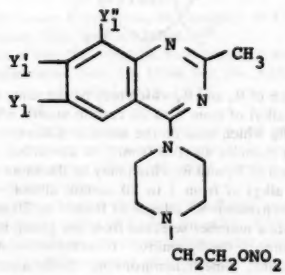
William R. Simpson, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

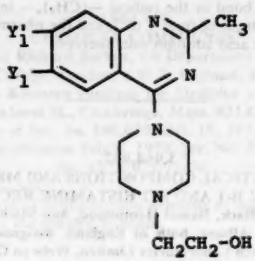
Division of Ser. No. 317,545, Dec. 22, 1972, Pat. No. 3,867,387, which is a continuation-in-part of Ser. No. 212,784, Dec. 27, 1971, abandoned. This application Dec. 3, 1974, Ser. No. 529,025

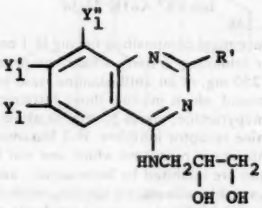
Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 5 Claims

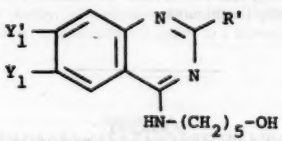
1. The method of treating myocardial shock comprising administering to a mammal in need of such treatment a myocardial shock treating effective amount of a compound selected from the group consisting of compounds of the formulae:







and



wherein R′ is alkyl of 1 to 4 carbon atoms, and each of Y_1, and Y_1' and Y_1'' is alkoxy of 1 to 3 carbon atoms, or a pharmaceutically acceptable non-toxic acid addition salt thereof.

3,954,988

USE OF LISURIDE AND PHYSIOLOGICALLY ACCEPTABLE SALTS THEREOF TO ACHIEVE PSYCHIC ENERGIZER EFFECTS

Turan M. Itil, Nyack, N.Y., and Werner Martin Herrmann, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Nov. 22, 1974, Ser. No. 526,303

Claims priority, application Germany, Nov. 24, 1973, 2359128

Int. Cl.[2] A61K *31/48*

U.S. Cl. 424—261 7 Claims

1. A method for the treatment of psychic disturbances manifested by

a. behaviorally disturbed and/or hyperkinetic children suffering from loss of concentration and memory and learning difficulties,

b. adolescents and adults with so-called neurasthenic symptomatology with at least of the following symptoms: loss of interest, loss of drive and activity, loss of energy and functional capacity, loss of concentration and learning ability and

c. geriatric patients with loss of interest, loss of drive and activity, loss of energy and functional capacity, loss of concentration and learing ability combined with severe disturbance in mental function, which comprises administering to the affected patient a dosage of N-D-6-methyl-8-isoergolenyl-N',N'-diethylurea or a physiologically acceptable acid addition salt thereof effective to ameliorate the psychic disturbance.

3,954,989

TOPICAL COMPOSITIONS CONTAINING AN ALLANTOIN ASCORBIC ACID COMPLEX

Sebastian B. Mecca, Abington, Pa., assignor to Schuylkill Chemical Company, Philadelphia, Pa.

Division of Ser. No. 462,779, April 22, 1974, Pat. No. 3,898,243. This application Feb. 10, 1975, Ser. No. 548,198

Int. Cl.² A61K *31/365, 31/415*

U.S. Cl. 424—273 **1 Claim**

1. A pharmaceutical composition useful for topical application comprising from about 0.5 to about 1%, by weight, based on the weight of the composition, of an allantoin ascorbic acid complex and a pharmaceutically acceptable carrier, said complex being formed by combining allantoin and ascorbic acid in a mol ratio of about 1 to 1.

3,954,990

BACTERICIDAL AND FUNGICIDAL CYCLIC DIMEDONE DERIVATIVES OF DIALDEHYDES

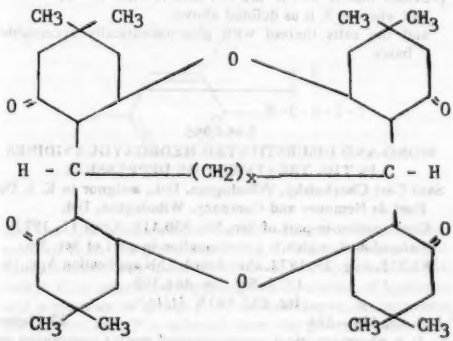
Robert G. Tabor, 1407 W. Tucker Blvd., Arlington, Tex. 76013, and Norman Zimmerman, 13 Colby St., Colebrook, N.H. 03576

Filed Nov. 8, 1973, Ser. No. 413,806

Int. Cl.² A01N *9/28*

U.S. Cl. 424—278 **4 Claims**

1. An anti-bacterial and fungicidal composition comprising a diluent, an emulsifier and an effective amount of a compound having the formula:



where x is an integer of from 1 to 6.

3,954,991

MOSQUITO LARVICIDE

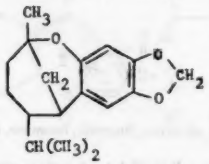
Kenneth L. Stevens, Walnut Creek, and Leonard Jurd, Berkeley, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 27, 1975, Ser. No. 554,053

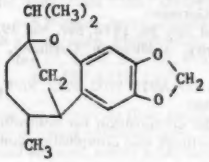
Int. Cl.² A01N *9/28*

U.S. Cl. 424—282 **4 Claims**

3. A method of killing mosquito larvae which comprises applying to said larvae a larvicidal amount of a mixture of the compounds having the structures



and



3,954,992

2-CYANO-2-HYDROXYIMINOACETAMIDES AS PLANT DISEASE CONTROL AGENTS

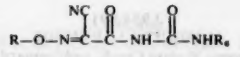
Sidney Hayes Davidson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 375,376, July 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 330,457, Feb. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 234,997, March 15, 1972, abandoned. This application Mar. 21, 1974, Ser. No. 453,392

Int. Cl.² A01N *19/00, 9/06*

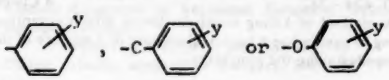
U.S. Cl. 424—287 **27 Claims**

16. A composition useful for inhibiting fungus diseases in plants consisting of an inert diluent and an amount of a compound sufficient to inhibit the fungus disease, said compound having the formula:

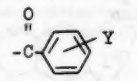


wherein

R is alkyl of 1 to 13 carbon atoms; alkyl of 1 to 13 carbon atoms substituted with alkoxycarbonyl of 2 to 4 carbon atoms, acyl of 2 to 4 carbon atoms, hydroxyl, cyano, acyloxy of 2 to 4 carbon atoms,



alkenyl, of 3 to 6 carbon atoms; cycloalkyl of 5 to 7 carbon atoms; acyl of 1 to 4 carbon atoms or



Y is hydrogen, chlorine, fluorine, bromine, methyl or cyano; and

R_6 is hydrogen, alkyl of 1 to 4 carbon atoms or allyl provided that the total number of carbon atoms in the substituent R is less than 14.

3,954,993

FUNGICIDAL COMPOSITION AND PROCESS

Ernst-Heinrich Pommer, Limburgerhof; Rudolf Polster, Frankenthal, and Friedrich Loecher, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 30, 1974, Ser. No. 493,099

Claims priority, application Germany, Aug. 11, 1973, 2340741

Int. Cl.² A01N 9/02, 9/12, 9/20, 9/22

U.S. Cl. 424—300 **7 Claims**

1. A fungicidal composition for controlling the growth of powdery mildew fungi, said composition comprising a mixture of:

a. diisopropyl 3-nitroisophthalate; and

b. a compound selected from the group consisting of 1,2-bis-(3-ethoxycarbonyl-2-thioureido)-benzene and 1,2-bis-(3-methoxycarbonyl-2-thioureido)-benzene,

the weight ratio of a:b being from 1:1 to 4:1.

3,954,994

INTERMEDIATES FOR PREPARING HIPOLIPEMIC AGENTS AND METHOD OF LOWERING THE BLOOD LIPID LEVEL IN MAMMALS WITH SAID AGENTS

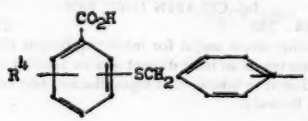
Gerald F. Holland, Old Lyme; Joseph G. Lombardino, and Richard C. Koch, both of Niantic, all of Conn., assignors to Pfizer Inc., New York, N.Y.

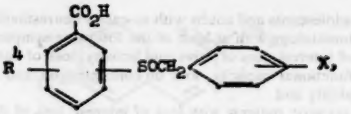
Division of Ser. No. 156,501, June 24, 1971, abandoned, and Ser. No. 156,502, June 24, 1971, abandoned, said Ser. No. 156,501, is a continuation of Ser. No. 764,951, Oct. 3, 1968, abandoned, which is a continuation-in-part of Ser. No. 723,321, April 22, 1968, abandoned, said Ser. No. 156,502, is a division of Ser. No. 764,951,. This application July 31, 1973, Ser. No. 384,395

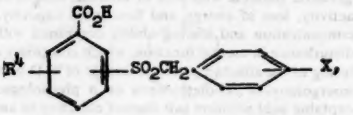
Int. Cl.² A61K 31/19

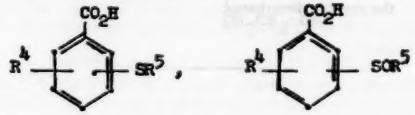
U.S. Cl. 424—317 **10 Claims**

1. A method for reducing blood lipid levels which comprises orally or parenterally administering to a hyperlipemic mammal an effective amount of a compound of the formula:

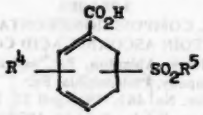








or

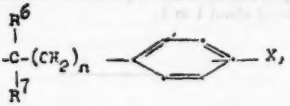


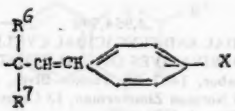
wherein

X is a member selected from the group consisting of H, $-CH_3$, CH_3O-, NO_2, Br, Cl, F, I, $-CF_3$, and CF_3SO_2-;

R^4 is a member selected from the group consisting of H, $-CH_3$, $-CF_3$, $-NO_2$, Cl, Br, F, $-OCH_3$, OCF_3 and CF_3SO_2-;

R^5 is a member selected from the group consisting of:

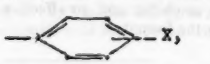




$-CH_2$-α-naphthyl and $-CH_2$-β-naphthyl;

n = 0-3;

R^6 and R^7 are members selected from the group consisting of H, lower alkyl of up to 6 carbon atoms and



provided that R^6 and R^7 are not both H when n = 0;

and wherein X is as defined above;

and the salts thereof with pharmaceutically acceptable bases.

3,954,995

MONO-AND DISUBSTITUTED HYDROXYGUANIDINES IN THE TREATMENT OF DEPRESSION

Saul Carl Cherkofsky, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 350,119, April 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 283,775, Aug. 25, 1972, abandoned. This application Apr. 16, 1974, Ser. No. 461,390

Int. Cl.² A61K 31/165

U.S. Cl. 424—326 **23 Claims**

1. A pharmaceutical composition of matter comprising an effective antidepressant amount of a compound selected from the group consisting of

1-phenyl-1-ethylhydroxyguanidine
1-p-chlorophenyl-1-methylhydroxyguanidine
1-m-chlorophenyl-1-methylhydroxyguanidine
1-p-tolyl-1-methylhydroxyguanidine
1-m-tolyl-1-methylhydroxyguanidine and a pharmaceutically acceptable acid addition salt thereof in the form of an injectable, a tablet, a capsule, a syrup, an elixir or a pharmaceutical mucilage.

3,954,996

WATER-SOLUBLE COMPOSITION COMPRISING A ROBENIDINE SALT

Chaim Simonovitch, Rishon Le-Zion, and Morris E. Stolar, Tel-Aviv, both of Israel, assignors to ABIC Ltd., Ramat-Gan, Israel

Filed July 15, 1974, Ser. No. 488,476
Claims priority, application Israel, July 20, 1973, 42800
Int. Cl.² A61K *31/155*
U.S. Cl. 424—326 **13 Claims**

1. A water-soluble composition comprising a physiologically acceptable salt of 1,3-bis([(p-chlorobenzylidine)-amino] quanidine, a physiologically acceptable water-soluble organic solvent in which said salt is soluble and a physiologically acceptable water-soluble surface active agent which acts as solubilizer for said salt and solvent in water, said solvent and said solubilizer being miscible with each other the ratio by weight of solvent to solubilizer being between about 1:1 and 1:10 and the ratio by weight of salt to solvent plus solubilizer being between about 0.1–5:99.9–95.

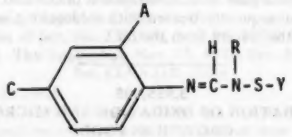
3,954,997

PESTICIDAL N-HYDROCARBYSULFENYL-N-ALKYL-N'-ARYLFORMAMIDINES

Victor L. Rizzo, Almena Township, Van Buren County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 366,999, June 1, 1973, Pat. No. 3,887,619. This application Dec. 30, 1974, Ser. No. 537,270
Int. Cl.² A01N *9/20*
U.S. Cl. 424—326 **11 Claims**

1. An arthropodicidal composition which comprises a pesticidally acceptable carrier, and an effective amount of a compound selected from the group consisting of those of formula:



and the acid addition salts thereof wherein A is a member selected from the group consisting of halogen, lower alkyl, halogen-substituted lower alkyl, lower alkoxy and lower thioalkyl; C, is selected from the group consisting of hydrogen and a member of group A as defined above; R represents lower alkyl and Y is selected from the group consisting of lower alkyl, halogen substituted lower alkyl, phenyl, halogen substituted phenyl, lower alkyl-substituted phenyl and lower alkoxy-substituted phenyl.

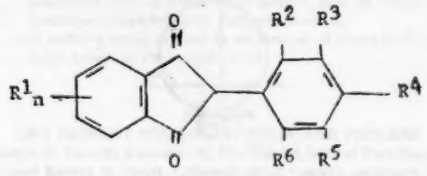
3,954,998

SUBSTITUTED PHENYL INDANDIONES AS MITICIDES

John A. Durden, South Charleston, and Anthony A. Sousa, St. Albans, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 816,024, April 14, 1969, abandoned. This application Aug. 31, 1973, Ser. No. 393,504
Int. Cl.² A01N *9/24*
U.S. Cl. 424—331 **7 Claims**

1. A method of controlling mites which comprises applying to the locus thereof a miticidally effective amount of a compound of the formula:



wherein R^1 is lower alkyl, lower alkoxy, or halogen, and n is an integer from 0 to 2; R^2 is lower alkyl, halogen or trifluoromethyl; R^3, R^4 and R^6 is hydrogen, hydroxy, halogen, lower alkyl and lower alkoxy; and R^5 is hydrogen, halogen and lower alkyl.

3,954,999

DOUGH-IMPROVER COMPOSITION

Frederick D. Vidal, Englewood Cliffs; Albert B. Gerrity, Hazlet, both of N.J., and Walter Clavan, Jenkintown, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed May 17, 1974, Ser. No. 470,767
Int. Cl.² A21D *2/08*
U.S. Cl. 426—61 **12 Claims**

1. A composition for improving flour and dough comprising a powdery mixture of strong oxidizing agent, organic flour and dough additive, and an inert, edibly acceptable, hydrated salt wherein the proportion of said hydrated salt in the mixture provides about 15 parts up to about 50 parts by weight of water per 100 parts by weight of the strong oxidizing agent and a Trauzl number for the mixture of less than 40.

3,955,000

CEREAL PROCESS AND PRODUCT

Patricia A. Baggerly, Battle Creek, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,299
Int. Cl.² A23L *1/164, 1/236*
U.S. Cl. 426—96 **11 Claims**

1. An artificially sweetened dry comestible comprising a hydrolyzed amylaceous dextrinous solids coating having an L-aspartic acid sweetening derivative uniformly and finely dispersed throughout the coating, said coating being uniformly distributed on the surface of the dry comestible.

3,955,001

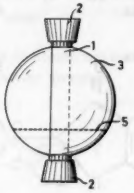
DUMPLING PACKAGE

Gerhard V. Kuepach, Hart, Germany; Karl Petutschning, Poing, Austria, and Günter Kluge, Vaterstetten, Germany, assignors to Pfanni-Werk Otto Eckart KG, Munich, Germany

Filed Nov. 21, 1973, Ser. No. 418,082
Claims priority, application Germany, Nov. 23, 1972, 2257459
Int. Cl.² A21D *10/02*
U.S. Cl. 426—111 **7 Claims**

1. The combination of a food product such as a dumpling which swells to a spherical shape when boiled in water and a

dumpling envelopment for storing and cooking said dumpling therein, said dumpling envelopment comprising a closed container made of an expansible sheet of teabag paper defining a spherical enclosure which contains said dumpling, said container including two integral pole seams disposed on diametrically opposed portions of said spherical enclosure, said closed container including at least one perforation extending across the surface of the spherical enclosure thereof, which perforation is offset with respect to an imaginary equator, circumferentially extending about the sperical enclosure, whereby after the dumpling has been cooked in the dumpling envelopment, and has expanded to a spherical shape so as to engage the interior of the spherical enclosure, the application of an axial pulling force on the opposed pole seams of the expansible envelopment separates the dumpling from the sperical enclosure in the vicinity of said perforation and tears the envelopment along said perforation without deforming the dumpling, thereby enabling the removal of the undeformed, cooked dumpling from the envelopment.



3,955,002

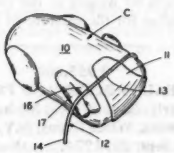
ROTISSERIE POULTRY

Steven T. Maxon, Downers Grove, Ill.; Michael Sebring, Phoenix, and Donald H. Ryan, Paradise Valley, both of Ariz., assignors to Armour and Company, Phoenix, Ariz.

Filed July 21, 1972, Ser. No. 273,948

Int. Cl.² A22C *18/00*

U.S. Cl. 426—132 **6 Claims**



1. In a method of preparing a poultry product the steps of severing a wing of a poultry carcass between the radius-ulna and humerus sections to remove the radius-ulna section of the wing from the carcass, making a slit in the skin of the body of the carcass at a point under the humerus section of said wing and inward of the end of said humerus section, stretching the slit skin while tucking said end under the slit skin, and releasing said skin to permit the same to draw over said end.

3,955,003

PACKAGING CONFECTIONERY PRODUCT

Henry W. Loos, Wilmette, and Robert J. Oswalt, Glenview, both of Ill., assignors to Kraftco Corporation, Glenview, Ill.

Filed Nov. 13, 1974, Ser. No. 523,436

Int. Cl.² B65B *55/00*

U.S. Cl. 426—132 **13 Claims**

1. A method for preparing an enrobed food product of irregular shape comprising forming a sheet of a caramel confectionery product, said caramel confection product comprising sugars including corn syrup solids having a DE between about 40 and about 80 and sucrose, the weight ratio of corn syrup solids to sucrose being greater than 1:1; milk protein at a level in excess of 4 percent; milk fat or edible fat having a softening point above 85°F and at a level between about 6 percent and about 13 percent; and total solids at a level of between about 87 percent and 93 percent, wrapping said sheet around said food product, placing said wrapped food product at a temperature at which said confectionery product will flow for a time sufficient to smooth the surface of said confectionery product, and cooling the enrobed food product, said sheet being formed by placing a piece of the confectionery product on a web and compressing the piece onto the web to thereby form a generally circular sheet.

3,955,004

GLYCERIDE OIL TREATMENT WITH OXIDE AND BLEACHING EARTH

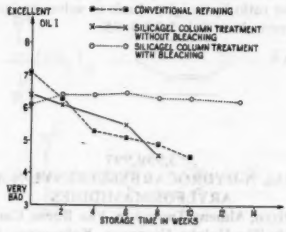
Hans Joerg Strauss, Hamburg; Achintya Kumar Sen Gupta, Schenefeld, and Johannes Erich Rost, Hamburg, all of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 16, 1974, Ser. No. 497,987

Claims priority, application United Kingdom, Aug. 24, 1973, 40150/73

Int. Cl.² A23L *1/22*

U.S. Cl. 426—254 **4 Claims**



1. A process for treating edible glyceride oil to improve its colour and its storage properties, in which the edible glyceride oil, in solution in a nonpolar solvent, said solution containing from 10–95% by weight of the solvent, is first contacted at a temperature between 0–60°C with a metal oxide or metalloid oxide adsorbent with an average pore size of between 30–2000 A selected from the group consisting of silicas and aluminas and mixtures thereof in a column containing the adsorbent, in a ratio of oil to adsorbent of 0.3:1 to 20:1, and the oil is subsequently treated with a bleaching earth after removal of the solvent from the oil.

3,955,005

RETARDATION OF OXIDATION AND MICROBIAL GROWTH IN FOODS

Richard D. Trelease, Downers Grove, and Robert B. Tompkin, La Grange, both of Ill., assignors to Swift & Company, Chicago, Ill.

Filed Nov. 14, 1973, Ser. No. 415,619

Int. Cl.² A23L *3/34*; **A23B** *4/14*

U.S. Cl. 426—310 **8 Claims**

1. A method for the biological stabilization of hydrous protein food material capable of supporting microbial growth, by inhibiting the development of microorganisms, by adding to said hydrous material a bacteriostatic agent consisting essentially of butylated hydroxy anisole in excess of about .02 percent by weight of the hydrous material.

3,955,006

METHOD OF PACKAGING FOOD USING A LINER

Burton H. Sokolsky, Highland Park, and William G. Barber, Deerfield, both of Ill., assignors to Burton H. Sokolsky, Highland Park, Ill.

Continuation of Ser. No. 158,425, June 30, 1971, abandoned. This application Nov. 5, 1973, Ser. No. 413,357

Int. Cl.[2] B65B *61/22, 51/10, 7/28*

U.S. Cl. 426—392 1 Claim

1. In a process for automatically packaging and covering, without use of heat, a chilled food product that partially fills the interior of a container, leaving the upper inner sidewall and uppermost rim portion of the container exposed to receive cover means thereonto, the improvement comprising the steps of: placing a sheet of flexible, but shape-sustaining material, having its support side coated with a pressure-sensitive adhesive, in overlying relation onto the uppermost rim portion of a container that is partially filled with a chilled food product, and then pressing a pre-formed outer cover member into the container and onto the uppermost rim portion of the container to force air from the container and to grippingly secure the outer cover to the rim portion of the container by a press fit while simultaneously flexing the sheet inwardly into the partially-filled container to pressure activate said pressure-sensitive adhesive and to pressure scrub a portion of said adhesive, as the sheet is flexed into the container, against both the uppermost rim portion and adjacent inner sidewall portions of the container, to effect a substantially continuous air-impervious adherent seal between the sheet and the portions of the container engaged by the sheet.

3,955,007

HEAT-HOLDING METHOD FOR FOOD AND THE LIKE

Ronald R. Roderick, Evergreen, Colo., assignor to National Equipment Corporation, Denver, Colo.

Division of Ser. No. 370,328, June 15, 1973, Pat. No. 3,868,941. This application Nov. 25, 1974, Ser. No. 526,516

Int. Cl.[2] A21D *15/04*

U.S. Cl. 426—418 6 Claims

1. A method of holding food and the like at substantially uniform temperature for extended periods of time while maintaining a desirable moisture content therein, comprising the steps of:

a. confining a relatively still volume of gas about a food and the like,

b. moving a flow of heated gas of a selected temperature about and in heat exchange relation to and relative to said volume of gas to provide substantially uniform heating of said volume of gas while at the same time maintaining said volume of gas in a relatively still condition, and

c. introducing a controlled quantity of moisture arranged in open fluid communication with said volume of gas into said volume of gas.

3,955,008

PREPARATION OF ICINGS

Max M. Hanamoto, Lafayette, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,859

Int. Cl.[2] A23G *3/00*

U.S. Cl. 426—572 8 Claims

1. An icing for bakery products being an aerated mixture comprising sugar, water, edible fat, and an additive,

wherein the additive is an ester of a fatty acid containing 12 to 18 carbon atoms and a polyoxyethylene ether of a propylene glycol glycoside, containing 1 to 2 moles of combined fatty acid per mole thereof, and 20 moles of combined ethylene oxide per mole thereof,

said additive being present in an amount of about 0.5% to 1.5% based on the weight of fat.

3,955,009

DRY DESSERT MIX COMPOSITION AND PROCESS

James D. Eskritt; Raymond H. MacDonald, both of Port Hope, and Robert R. Sirett, Cobourg, all of Canada, assignors to General Foods Limited, Toronto, Canada

Filed May 2, 1974, Ser. No. 466,585

Int. Cl.[2] A23L *1/187*; A23C *9/10*

U.S. Cl. 426—578 5 Claims

1. A dry dessert mix composition for use in preparing a yoghurt-like dessert by reconstitution with milk comprising a pregelatinized starch, an edible acid present in an amount sufficient to bring the pH of the milk-reconstituted mix to 3 to 5, and a hydrocolloid gum.

3,955,010

EMULSIFIED OIL DRESSINGS

Chris Chozianin, Morton Grove, and John G. Oles, Glenview, both of Ill., assignors to Kraftco Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 268,746, July 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 66,653, Aug. 24, 1970, abandoned. This application Sept. 11, 1974, Ser. No. 505,048

Int. Cl.[2] A23L *1/24*

U.S. Cl. 426—605 5 Claims

1. An improved, bland tasting emulsified oil dressing composition having high moisture and low fat and which is resistant to bacteriological spoilage at room temperature, comprising an edible oil in an amount of between about 1 percent and about 50 percent, moisture at a level of between about 40 percent and about 80 percent, egg yolk at a level of less than about 8 percent, yeast and mold preventive agent, bacterial nutrient ingredients at a level of less than about 1 percent by weight of the composition, and an edible acid, said edible acid being present at a level of between about 0.45 percent and about 1.8 percent equivalent glacial acetic acid by weight based on the level of moisture and providing a pH below about 4.1.

3,955,011

METHOD OF MANUFACTURING FISH MEAT POWDER CAPABLE OF MAKING THE KAMABOKO

Hiroshi Niki; Toru Doi, both of Sapporo; Seiichiro Igarashi, Tokorozawa, and Toshiro Kanauchi, Komae, all of Japan, assignors to Snow Brand Milk Products Co. Ltd., Sapporo, Japan

Filed Feb. 6, 1975, Ser. No. 547,652

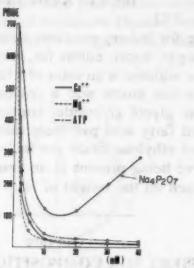
Int. Cl.[2] A22C *25/00*

U.S. Cl. 426—643 6 Claims

1. A method for manufacturing a fish meat powder which retains the ability to form a kamaboko over an extended period of time, said kamaboko having a jelly strength approximately that produced from fresh fish meat, said method comprising:

forming an aqueous slurry of fresh undenatured fish meat or one prepared from frozen SURIMI;

adding a salt of an alkaline earth metal ion to said slurry in an amount sufficient to reduce the viscosity to a value suitable for spray-drying without causing denaturation;



adjusting the pH of said slurry to approximately neutrality; and

spray-drying said slurry to form the fish meat powder.

3,955,012

METHOD FOR MANUFACTURING MEDICAL ARTICLES COMPOSED OF SILICONE RUBBER COATED WITH COLLAGEN

Seizo Okamura, Kyoto, and Tsunetoshi Hino, Higashi-Osaka, both of Japan, assignors to Zaidan Hojin, Seisan Kaihatsu Kagaku Kenkyusho, Kyoto, Japan

Continuation-in-part of Ser. No. 167,850, July 30, 1971, Pat. No. 3,808,113. This application Nov. 16, 1973, Ser. No. 416,658

Claims priority, application Japan, Aug. 6, 1970, 45-68898

Int. Cl.² B05D *3/06*

U.S. Cl. 427—2 **5 Claims**

1. A method of manufacturing medical articles composed of silicone rubber coated with collagen and to be used in a living body comprising

subjecting a surface of shaped articles composed of silicone rubber in an oxygen-containing atmosphere to a spark discharge wherein the product of the spark length in centimeters and the discharge time per square centimeter is in the range of 9 to 12 cm.sec/cm²,

coating the thus treated surface with an acidic aqueous solution of collagen,

drying the collagen coated shaped article at a temperature lower than the denaturation temperature of collagen to form a collagen layer, and

irradiating the shaped article coated with collagen layer with gamma ray or electron beam to a dosage of $1\text{-}5\times10^6$r or the equivalent dosage of ultraviolet light under an atmosphere having a humidity such that the water content of the coated collagen becomes greater than 20% by weight, thus fixing the collagen layer.

3,955,013

NOVEL PROCESS FOR PRODUCING A THIN FILM OF GERMANIUM

Herbert D. Kivlighn, Jr., Bethpage, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation-in-part of Ser. No. 311,962, Dec. 4, 1972, Pat. No. 3,824,123. This application June 21, 1974, Ser. No. 481,669

Int. Cl.² C03C *19/00;* **B05D** *5/12*

U.S. Cl. 427—53 **10 Claims**

1. A process for the preparation of a thin film of elemental germanium on the surface of a selected area of a germanate glass composition which includes at least 60 mole percent of germanium dioxide, said method consisting essentially of heating a selected area of said germanate glass composition with a laser beam of effective wave length and power in the presence of a reducing atmosphere until formation of said thin film of elemental germanium is complete.

3,955,014

METHOD OF MAKING ALKALI BATTERY SEPARATORS

Rafail Velislavov Mostev; Hrisanta Nicolaeva Budevska, and Latinca Tantilova Ivanova, all of Sofia, Bulgaria, assignors to Zlehit pri Ban, Sofia, Bulgaria

Continuation-in-part of Ser. No. 216,244, Jan. 7, 1972, abandoned. This application May 31, 1974, Ser. No. 474,919

Int. Cl.² B05D *3/06;* **H01M** *2/16*

U.S. Cl. 427—54 **10 Claims**

1. A method of producing alkaline battery separators comprising ultraviolet irradiating a low-density polyethylene film in the presence of a sensitizer and air at ambient temperature and normal pressure, grafting the irradiated film in the absence of any reducing agent with an ethylenically unsaturated carboxylic acid monomer at a temperature of 70°–90°C in the absence of irradiation while the film is under compression of at least 0.5 kg/cm² and is sandwiched with a porous web spacer, and converting the grafting film to its potassium form.

3,955,015

METHOD OF MANUFACTURING A TRANSPARENT LIGHT CONDUCTING ELEMENT OF SYNTHETIC RESIN HAVING REFRACTIVE INDEX GRADIENT

Yasuji Ohtsuka, Tokyo, and Motoaki Yoshida, Takarazuka, both of Japan, assignors to Nippon Selfoc Co., Ltd., Japan

Filed Oct. 18, 1973, Ser. No. 407,625

Claims priority, application Japan, Oct. 23, 1972, 47-106387

Int. Cl.² G02B *5/14;* **B32B** *27/02*

U.S. Cl. 427—163 **16 Claims**

1. A method of manufacturing a transparent light conducting element of synthetic resin in which a continuous change takes place in the refractive index progressively from the surface of the element to its interior, said method comprising, in combination, the steps of

1. submitting a monomer A to a prepolymerization reaction, said monomer A being one that can form a transparent network polymer by the polymerization reaction, and before completion of the polymerization reaction and at a stage wherein 2 – 80% by weight of a solvent-soluble component is contained, interrupting the polymerization reaction to form a prepolymer;
2. imparting a desired form to the prepolymer to obtain an article thereof having a uniform refractive index;
3. contacting for a predetermined time said prepolymeric article on at least a part of the surface thereof with a monomer B, said monomer B being one which forms a transparent completely polymerized polymer having a refractive index different from that of the completely polymerized polymer formed from said monomer A, said predetermined time being selected such that a gradient in the concentration of the monomer B diffused within said article is set up, said concentration gradient being one which gradually decreases from the contact surface to the interior of the article, wherein when a part or all of the diffused monomer has been polymerized, the amount of the monomer B corresponding to that which has been polymerized being included in calculating the concentration; and
4. carrying out a postpolymerization step consisting of polymerizing the monomer B present in the article and completing the polymerization of the prepolymer, whereby said gradient in the concentration of the monomer B forms said continuous change of the refractive index without causing objectionable turbidity, concurrently with step (3).

9. A method of manufacturing a transparent light conducting element of synthetic resin in which a continuous change

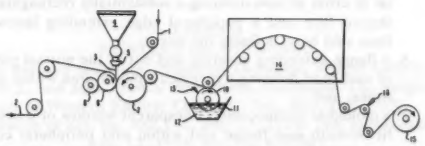
takes place in the refractive index progressively from the surface of the element to its interior, said method comprising, in combination, the steps of:

1. submitting a monomer A to a prepolymerization reaction, said monomer A being one that can form a transparent network polymer by the polymerization reaction, and before completion of the polymerization reaction and at a stage wherein 2-80% by weight of a solvent-soluble component is contained, interrupting the polymerization reaction to form a prepolymer;
2. imparting a desired form to the prepolymer to obtain an article thereof having a uniform refractive index;
3. contacting for a predetermined time said prepolymeric article on at least a part of the surface thereof with a monomer B, said monomer B being one which forms a transparent completely polymerized polymer having a refractive index different from that of the completely polymerized polymer formed from said monomer A, said predetermined time being selected such that a gradient in the concentration of the monomer B diffused within said article is set up, said concentration gradient being one which gradually decreases from the contact surface to the interior of the article, wherein when a part or all of the diffused monomer has been polymerized, the amount of the monomer B corresponding to that which has been polymerized being included in calculating the concentration; and
4. carrying out a postpolymerization step consisting of polymerizing the monomer B present in the article and completing the polymerization of the prepolymer, whereby said gradient in the concentration of the monomer B forms said continuous change of the refractive index without causing objectionable turbidity, subsequent to step (3).

3,955,016
FOIL COATING PROCESS

James Adolph Robertson, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 12, 1974, Ser. No. 496,852
Int. Cl.² B32B *15/20, 27/32;* **B05D** *3/00*
U.S. Cl. 427—178 **8 Claims**



1. An improved method for the extrusion coating of a film of polyethylene onto an elongated sheet of aluminum foil wherein a layer of support material is adhered to a first surface of the foil and the foil is then rolled up for temporary storage before the extrusion coating of the film of polyethylene onto the second surface of the foil, and wherein the adhesion of the polyethylene to the foil is enhanced by applying to the second surface of the foil an aqueous solution of chromium (III) coordination complex adherence promoter after storage and before extrusion coating, wherein the improvement comprises,

a method for protecting the second surface of the foil from contamination from the support material which could impair adhesion of the polyethylene to said second surface,

said method comprising applying to the second surface of the foil before the foil is rolled for temporary storage a wash coat of polyvinyl alcohol dissolved in water and drying said wash coat.

3,955,017
METHOD OF COATING METAL PHOSPHATES ON ORGANIC POLYMERIC SUBSTRATES

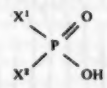
Neville Colebourne; Nicholas Rolfe; Kevin Thomas McAloon, and Michael Leslie Orton, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed July 17, 1972, Ser. No. 272,498
Claims priority, application United Kingdom, Nov. 26, 1971, 55001/71
Int. Cl.² B05D *3/04;* **B32B** *15/08*
U.S. Cl. 427—383 **9 Claims**

1. A method of applying a continuous coating consisting essentially of a metal phosphate to the surface of an organic polymer article comprising applying to the surface a liquid composition containing a solution of

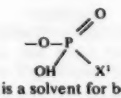
a. a compound of a metal selected from the group consisting of Mg, Ca, Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Y, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, In, Sn, Ba, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Hf, Ta, W, Re, Os, Ir, Pb, Au, Hg, Th and U; and

b. an oxyacid of phosphorus or a compound capable of forming such an oxyacid in the solution, the oxyacid being an ortho- or meta-acid of the structure (1)



(1)

Where X^1 and X^2 are the same or different and selected from hydrogen, hydroxyl, halide or which have the structure (2) to provide pyrophosphoric acid



(2)

wherein the solvent is a solvent for both components (a) and (b) and contains an organic component and the atomic ratio of metal to phosphorus is in the range 1:0.1 to 1:2.9 and converting the coating so formed to a metal phosphate by air-drying or by heating to give a coating of 0.01 to 5 microns thickness.

3,955,018
METHOD FOR FORMING A DECORATIVE COATED POROUS MASS AND THE ARTICLE PRODUCED THEREBY

Nicholas Liberto, and Charles Liberto, both of Baltimore, Md., assignors to Aqualine Products, Inc., Baltimore, Md.

Filed July 22, 1974, Ser. No. 490,236
Int. Cl.² A01N *1/00*
U.S. Cl. 428—16 **16 Claims**

1. A method of coating a porous mass of natural coral or articial coral for use as an ornamental piece comprising the steps of:

preparing a solvent solution;

blending polystyrene plastic granules into said solution and agitating said blend to form a uniform consistency;

adding a non-water soluble aniline base dye of a preselected color to said blend to form a mixture, and agitating said mixture whereby said dye is completely dispersed in said blend;

coating said mass of coral with said mixture; and

drying said coated mass of coral.

3,955,019

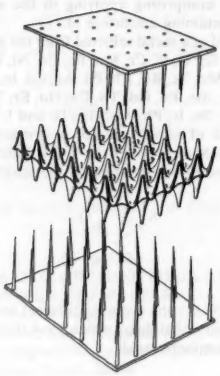
CUSPATED SHEET FORMING

Donald George Keith, 32 Volitans Ave., Mount Eliza, Victoria 3930, Australia

Continuation-in-part of Ser. No. 307,211, Nov. 16, 1972, abandoned. This application Apr. 16, 1974, Ser. No. 461,418

Int. Cl.[2] B32B *3/30, 1/00*

U.S. Cl. 428—35 13 Claims



1. A laminate comprising a porous sheet and a core which includes a single or double cuspated sheet of melt-spinnable thermoplastic material having a series of hollow projections projecting upwardly and downwardly from the median plane of said sheet and wherein the outer tips of the projections on the ends furthest from the median plane are closed and the ends of the projections in the median plane are open and wherein the projections form a series of pointed cusps, the points of the cusps on at least one face having been melted and at least partially allowed to impregnate into the pores in the porous sheet thereby laminating said sheet to said core, said porous sheet being selected from the group consisting of fabrics, either woven or melded and made from either natural or synthetic fibre, tissue; metal gauze and mesh; and finely perforated sheet material.

3,955,020

GLASS CONTAINER WITH PLASTIC WRAPPER

Joseph C. Cavanagh, Bay Shore, N.Y.; Michael D. Cromb, Shrewsbury, and Emanuel E. Terner, Oakhurst, both of N.J., assignors to Midland Glass Company, Cliffwood, N.J.

Filed June 20, 1973, Ser. No. 371,679

Int. Cl.[2] B65D *11/16*

U.S. Cl. 428—35 30 Claims

1. In a glass container having a straight section, the improvement which comprises adherence to essentially only the straight section of the container of a unitary plastic laminate, the laminate comprising an inner plastic lamina formed of a material selected from the group consisting of polyethylene, ionomers, polyesters, polyvinyl chloride, butadiene copolymers, nylon, polyethylene terephthalate, and cellulosic materials; and an outer plastic lamina, of equal size to and in alignment with said inner plastic lamina, formed of a material selected from the class consisting of polypropylene, nylon, polyethylene terephthalate, ionomers, butadiene-styrene copolymers, polyvinyl chloride, and cellulosics; with a graphic

design between the inner plastic lamina and the outer plastic lamina.

3,955,021

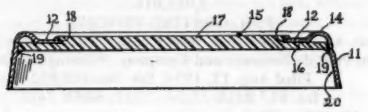
METER BOX WINDOW COVER

Thomas H. Cleavenger, Chicago, Ill., assignor to Cleavenger Associates, Inc., Chicago, Ill.

Filed Mar. 6, 1974, Ser. No. 448,658

Int. Cl.[2] B32B *1/04, 3/02*

U.S. Cl. 428—81 2 Claims



1. A meter box window cover having

a. a metallic frame providing a peripheral bead semi-circular in cross section defining a substantially rectangularly shaped face and a peripheral edge extending laterally from said bead defining the cover,

b. a flange extending inwardly and out of the normal plane of said bead defining a recessed window area within said frame, and

c. a moldable thermoplastic transparent window of a size to fit beneath said flange and within said peripheral edge and providing a thickened medial portion within said recessed window area, with the edges of said medial portion overlapping said flange for securing said window within said frame.

3,955,022

ANTISTATIC TUFTED CARPET

Seymour Sands, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

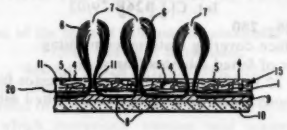
Filed Oct. 16, 1972, Ser. No. 297,805

Int. Cl.[2] D03D *27/00;* D04H *11/00;* D05C *17/00*

U.S. Cl. 428—95 5 Claims

1. A primary carpet backing having a thickness of less than 2 mm. measured at a pressure of 240 g./cm.[2] and comprising a 2 to 6 oz./yd.[2] woven or bonded nonwoven sheet of continuous filaments or ribbons of polypropylene and having needled thereto a 1 to 6 oz./yd.[2] layer of a staple fiber blend containing from about 0.5 to 30% by weight of conductive carbon-containing synthetic organic fiber having a specific resistance of less than 1×10^4 ohm. cm.

4. Tufted carpet having low static propensity, comprising a backing composite having a thickness of less than 2 mm. measured at a pressure of 240 g./cm.^{2} and comprising a 2 to 6 oz./yd.^{2} woven or bonded nonwoven sheet of continuous filaments or ribbons of polypropylene and having needled



thereto a 1 to 6 oz./yd.^{2} layer of a staple fiber blend containing from about 0.5 to 30% by weight of conductive carbon-containing synthetic organic fiber having a specific resistance of less than 1×10^4 ohm. cm. and pile yarn tufted through the backing composite.

3,955,023

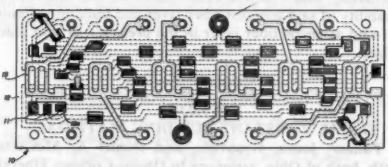
BLACK DIELECTRIC MASK ON WHITE SUBSTRATE

John Alexander Blakely, Lakewood, Colo., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 1, 1974, Ser. No. 520,071

Int. Cl.^{2} B32B *3/00, 7/14*

U.S. Cl. 428—201 **4 Claims**



1. A display supporting substrate which comprises a base layer of Al_2O_3 having at least one metalization layer patterned thereon and covered by at least one insulation layer comprising a layer of Al_2O_3 mixed with up to 20% by wt. of one of the group consisting of (1) molybdenum, (2) tungsten, (3) molybdenum oxide, and (4) tungsten oxide.

3,955,024

PRINTED CIRCUIT BOARD

Ira Bernard Goldman, Princeton Township, Mercer County, N.J., and John Francis Henrickson, Richmond, Va., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 489,282, July 17, 1974. This application Aug. 12, 1975, Ser. No. 603,989

Int. Cl.^{2} B32B *15/08, 27/04, 27/38;* **H05K** *1/00*

U.S. Cl. 428—209 **3 Claims**

1. A printed circuit board comprising:

a. a dielectric polymer substrate having a layer of an epoxy-polyester resin, produced by interreacting (1) a branched-chain, acid-terminated polyester of dicarboxylic acid, dihydroxy alcohol and a polyfunctional compound selected from the class consisting of polyhydric alcohols having at least three nontertiary hydroxyl groups and polybasic acids having at least three carboxyl groups not more than one-half of the total of said acids and alcohols containing aromatic rings, which polyester contains an average of 2.1 to 3.0 carboxyl groups per molecule, has an acid number of 15 to 125, a hydroxyl number of less than 10, and is free from ethylenic unsaturation in its skeletal chain, and (2) an epoxy compound containing on the average at least 1.3 reactive grous readily reactive with the carboxyl group in saidpolyester, at least one of which reactive groups is the oxirane group, said reactive groups being separated by a chain of at least two carbon atoms, the chain being free from ethylenic unsaturation, said epoxy-polyester layer being cured to a state of partial cure and covering at least a portion of an internal skeleton comprising a fabric support impregnated with said epoxy-polyester resin cured to a state of full cure; and

b. at least one conductive pattern on a surface of said partially cured epoxy-polyester layer.

3,955,025

PRESSURE-SENSITIVE COPYING SHEET

Hiroharu Matsukawa, and Keiso Saeki, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 2, 1974, Ser. No. 511,330

Claims priority, application Japan, Oct. 2, 1973, 48-110702

Int. Cl.^{2} B32B *7/00;* **B41L** *1/36;* **B32B** *5/16*

U.S. Cl. 428—212 **7 Claims**

1. A pressure-sensitive recording sheet which comprises a support having thereon a color former-containing microcapsule coating, said color former being an electron donor colorless organic compound capable of forming a color when contacted with a solid acid, said microcapsule coating comprising at least two microcapsule layers with the mean particle size of the microcapsules in the microcapsule layer closest to the support being larger than the mean particle size of the microcapsules in the microcapsule layer farther away from the support wherein the ratio of the mean particle size of the microcapsules in the microcapsule layer closest to the support to the mean particle size of the microcapsules in the microcapsule layer farther away from the support is at least above about 1.5.

3,955,026

PRESSURE-SENSITIVE RECORDING SHEET

Hiroharu Matsukawa, and Keiso Saeki, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Ginami-ashigara, Japan

Filed Oct. 2, 1974, Ser. No. 511,338

Claims priority, application Japan, Oct. 2, 1973, 48-110701

Int. Cl.^{2} B41M *5/16, 5/22*

U.S. Cl. 428—212 **9 Claims**

1. A pressure-sensitive recording sheet which comprises a support having thereon a color former-containing microcapsule coating, said microcapsule coating comprising at least two microcapsule layers containing color former with the color former concentration in the microcapsules in the microcapsule layer closest to the support being higher than the color former concentration in the microcapsules in the microcapsule layer farther away from the suppport.

3,955,027

PROCESS AND COMPOSITION FOR WATER- AND OIL-PROOFING TEXTILES

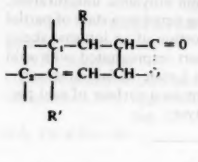
Walter L. Vaughn, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 242,747, April 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 10,008, Feb. 9, 1970, abandoned. This application Aug. 15, 1974, Ser. No. 497,781

Int. Cl.^{2} B32B *7/00*

U.S. Cl. 428—262 **3 Claims**

1. A process for improving the oil- and/or water-repellent properties of textiles which comprises treating the textile with from 10 to 100 weight percent pick-up of a treating composition and curing the treated textile at from about 80°C to about 170°C for a period of time of from about 0.1 to about 60 minutes, wherein the treating composition comprises an inert, anhydrous solvent containing from about 0.1 to about 10 weight percent of a polymeric fluorocarbon finishing agent, and from about 0.3 to about 10 weight percent of one or more polyalkylene copolymer extenders of the formulae



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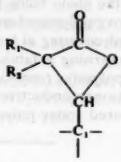

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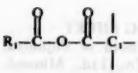
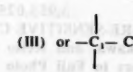


(III) or



(IV),

wherein C_1 and C_2 are, independently, carbon atoms of the polyalkylene chain represented by $-CH_2-(CH_2)_n-$; R and R′ are, independently, hydrogen, an alkyl group of up to about 20 carbon atoms, phenyl, —COOH, or a segment of the polyalkylene chain; R_1 and R_2 are, independently, alkyl, aryl, aralkyl or alkaryl groups of up to about 20 carbon atoms, and X is a halogen, said polymeric extender having a molecular weight of from about 800 to about 8000.

3,955,028

PROCESS FOR FORMING A FLAME RETARDANT ARTICLE AND ARTICLE THEREOF

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 477,721, June 10, 1974, abandoned. This application July 18, 1974, Ser. No. 489,674

Int. Cl.² C09D *5/18*; C09K *3/28*

U.S. Cl. 428—272 **10 Claims**

1. A process for flame retarding a normally flammable substrate, which comprises treating said substrate with an effective amount of at least one compound of the formula

$$[(BrCH_2)_3CCH_2O]_2P(O)R$$

wherein R is selected from the group consisting of —CH=CH_2, —CH_2X, —OR′OC(O)CH=CH_2, and —NR″R‴, where R′ is a C_1–C_4 alkylene group, R″ and R‴ are the same or different and are selected from the group consisting of hydrogen, lower alkyl, phenyl, hydroxy lower alkyl and allyl, and X is selected from the group consisting of chlorine and bromine, to thereby incorporate said compound in or on said substrate.

3,955,029

PROCESS FOR MAKING FLAME RETARDANT MATERIAL

Albert Y. Garner, Yellow Springs, Ohio, assignor to Monsanto Research Corporation, St. Louis, Mo.

Filed July 22, 1974, Ser. No. 490,609

Int. Cl.² C09K *3/28*

U.S. Cl. 428—277 **9 Claims**

1. A process for making flame-retardant material from cellulose, cotton, paper or cellulose sponge, polyester, wool of blends thereof comprising treating said material with an aqueous solution of a product of $Cl_3P{=}N{-}N{=}PCl_3$ reacted with anhydrous ammonia in excess over that required to combine with all the chlorine atoms in sufficient amount and curing the treated material at a sufficient temperature to make the treated and cured material self-extinguishing when subjected to a flame sufficient to ignite and consume the untreated material.

3,955,030

SURFACE COVERING MATERIAL HAVING IMPROVED DIMENSIONAL STABILITY

Donald C. Winters, Plainfield, N.J., assignor to Congoleum Industries, Inc., Kearny, N.J.

Continuation-in-part of Ser. No. 13,154, Feb. 20, 1970, abandoned. This application Oct. 2, 1972, Ser. No. 294,282

Int. Cl.² B26B *19/02*

U.S. Cl. 428—280 **13 Claims**

1. A surface covering material comprising:

a. a layer of felted asbestos fibers,

b. about 22 to 37% by weight of said asbestos fiber layer of a resinous binder impregnating said felted asbestos fiber layer,

c. a plasticized resinous wear layer applied to said felted asbestos fiber layer and formed of synthetic resins selected from the group consisting of polymerized vinyl halide resins, polymerized vinyl acetates, polymerized acrylic acid, polymerized alkyl esters of acrylic acid, and polymerized alkyl esters of methacrylic acid, and

d. said resinous binder consisting essentially of a mixture of a synthetic rubber and about 2% to about 20% by dry weight of said felted asbestos fibers layer of a reactive resin selected from the group consisting of hexamethoxymethylmelamine; 1-hydroxymethyl-3,5-dimethoxymethylmelamine; N,N-dimethylol urea; dihydroxymethylolethylene urea; N,N-bis(methoxymethyl) urea; 'dimethylolpropylene urea; 5,5-dimethyl-N,N′-dimethylolpropylene urea; and N,N′-dimethylolethylene urea; and

e. whereby said reactive resin improves the dimensional stability of said asbestos fiber layer and reduces softening of said asbestos fiber layer in the presence of said plasticizer.

3,955,031

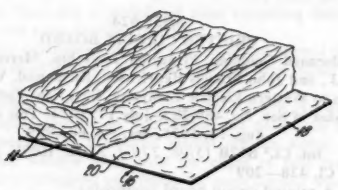
FLAME RESISTANT BUILDING MATERIAL

Isaac Palmer Jones, Granville, and Daniel A. McCartan, Heath, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 324,616, Jan. 18, 1973, abandoned. This application Feb. 4, 1974, Ser. No. 439,472

Int. Cl.² B32B *17/10*, *17/12*

U.S. Cl. 428—288 **2 Claims**



1. A wall or ceiling board comprising: a body of glass fibers having a density between 3 and 15 lbs. per ft.³, a layer of paper weighing from approximately 20 to 50 lbs. per 3000 ft.², said layer of paper being bounded to said glass fibers by a coating of from 4.5 to 15 lbs. per 3000 ft.² of a halogen containing self-extinguishing thermoplastic polymeric material, said paper also having a coating on its outer surface of from 4.5 to 15 lbs. per 3000 ft.² of a halogen containing self-extinguishing thermoplastic polymeric material, one of said coatings having a vapor transmission rate of less than one perm, and whereby the wall or ceiling board has a low flame spread rate when tested in accordance with ASTM Specification E84–70 that is acceptable as a building material.

3,955,032

FLAME RETARDANTS FOR NATURAL AND SYNTHETIC MATERIALS

Vladimir Mischutin, Union City, N.J., assignor to White Chemical Corporation, Bayonne, N.J.

Continuation-in-part of Ser. No. 300,731, Oct. 25, 1972, Pat. No. 3,877,974. This application Nov. 14, 1973, Ser. No. 415,667

The portion of the term of this patent subsequent to Aug. 15, 1992, has been disclaimed.

Int. Cl.² B32B *27/20;* **C09K** *3/28*

U.S. Cl. 428—290 **11 Claims**

1. A method of rendering flammable textile materials flame retardant which comprises: treating said materials with a flame retardant composition consisting essentially of chlorinated cyclopentadieno compounds, chlorobrominated cyclopentadieno compounds, employed alone or in admixture with each other, or in admixture with brominated cyclopentadieno compounds, and a metallic oxide, in aqueous dispersion, in admixture with an aqueous emulsion of a suitable high molecular weight polymeric adhesive binder, said compounds and metallic oxide being solids at room temperature, substantially totally insoluble in water, having been reduced to an average particle size below 2 microns, and being in weight ratio of 1:4 parts of said compounds to 0.1:1 part of metallic oxide, said high molecular weight polymeric binder being present in amount sufficient to secure said compounds and metallic oxide flame retardant composition to said material, and drying and curing said treated material, wherein the total amount of flame retardant deposited on said material is effective to reduce the flammability of the textile and is durable to laundering and dry cleaning.

3,955,033

ADHESION OF GLASS FIBERS TO RUBBER

Otto C. Elmer, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Nov. 13, 1974, Ser. No. 523,645

Int. Cl.² B29H *9/10;* **B32B** *17/04, 27/42, 25/02*

U.S. Cl. 428—295 **8 Claims**

5. A bonded composite material comprising a glass fiber reinforcing element embedded in a vulcanized rubber, said element containing from about 10 to 40% by weight (dry) based on the weight of said element of a heat cured adhesive composition consisting essentially of 100 parts by weight of a rubbery vinyl pyridine copolymer and from about 8 to 75 parts by weight of a water soluble, heat reactable o-cresol-formaldehyde-resorcinol resin, said composition forming a bond between said element and said rubber, wherein the mol ratio of the o-cresol to the resorcinol is from about 1:1 to 1:5 and wherein the formaldehyde is present in a molar excess over the total mols of o-cresol and resorcinol in the resin, said composition coating and at least substantially totally impregnating said element.

3,955,034

THREE-COMPONENT CERAMIC COATING FOR SILICA INSULATION

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Alexander Pechman, Mountain View, and Robert M. Beasley, all of Sunnyvale, Calif.

Filed June 24, 1974, Ser. No. 482,105

Int. Cl.² C04B *35/14, 43/00*

U.S. Cl. 428—332 **13 Claims**

1. An insulating structure for withstanding repeated exposure to cyclical temperature changes of from about −250°F. to about 2,500°F., said structure comprising a substrate having thereon a moisture-impervious ceramic laminate coating which comprises:

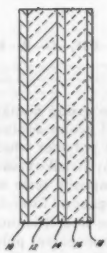
a. a barrier layer consisting essentially of fused silica, said barrier layer adhered to said substrate;

b. an emissivity layer consisting essentially of a high silica glass and an emissivity agent selected from the group of silicon carbide, nickel oxide, chrome oxide, cobalt oxide, nickel-chrome spinel, silicon nitride, calcined mixed oxides of iron, chrome and cobalt, and mixtures thereof, with the weight ratio of high silica glass to emissivity agent being from about 50:1 to about 4:1; and

c. an overglaze layer consisting essentially of a high silica glass and a borosilicate glass having a composition of from about 70 to about 87 wt.% SiO_2, from about 10 to about 20 wt.% B_2O_3, from about 2 to about 5 wt.% Na_2O and from about 1 to about 5 wt.% Al_2O_3, with the weight ratio of high silica glass to borosilicate glass being from about 3:1 to about 19:1.

7. A method of rendering impervious to moisture a substrate which comprises sequentially applying to said substrate and firing at a temperature of from about 1,700°F. to about 2,500°F.

a. a barrier coating consisting essentially of a fused silica slip having from about 80 to about 90 wt.% solids;



b. an emissivity coating consisting essentially of a high silica glass, an emissivity agent selected from the group of silicon carbide, nickel oxide, chrome oxide, cobalt oxide, nickel-chrome spinel, silicon nitride, calcined mixed oxides of iron, chrome and cobalt and mixtures thereof, and an effective amount of a suspension agent in an aqueous slurry containing from about 10 to about 90 wt.% solids, with the weight ratio of high silica glass to emissivity agent being from about 50:1 to about 4:1; and

c. an overglaze coating consisting essentially of a high silica glass, a borosilicate glass having a composition of from about 70 to about 87 wt.% SiO_2, from about 10 to about 20 wt.% B_2O_3, from about 2 to about 5 wt.% Na_2O, and from about 1 to about 5 wt.% Al_2O_3, and an effective amount of a suspension agent in an aqueous slurry containing from about 10 to about 90 wt.% solids, with the weight ratio of high silica glass to borosilicate glass being from about 3:1 to about 19:1.

3,955,035

TRANSPARENT RESIN COMPOSITE

Akihiko Ito; Isao Kaetsu; Hiroshi Okubo; Masamichi Kato, all of Takasaki, and Koichiro Hayashi, Saita, all of Japan, assignors to Japan Atomic Energy Research Institute, and Tokyo Optical Company, Ltd., both of Japan

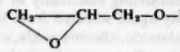
Filed Aug. 6, 1974, Ser. No. 495,169

Claims priority, application Japan, Aug. 14, 1973, 48-90535

Int. Cl.² B32B *27/38, 27/08*

U.S. Cl. 428—334 **8 Claims**

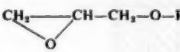
1. A transparent resin composite comprising a substrate of a transparent plastic material coated with a cured film of at last one [(2,3-epoxypropoxy)alkyl]trialkoxysilane represented by the general formula:



whereby R is an alkylene group containing up to 4 carbon atoms and R' is an alkyl group containing up to 4 carbon atoms.

2. The transparent resin composite as claimed in claim 1, wherein R of the general formula is one of methylene, ethylene and trimethylene and R' is one of methyl, ethyl, n-propyl and n-butyl; and the transparent plastic material is selected from a class consisting of poly(vinyl chloride) resin, poly(vinylidene chloride) resin, polycarbonate resin, poly(lower-alkyl acrylate) resins, poly(lower-alkyl methacrylate) resins, poly(diethyleneglycol bis(allyl carbonate)) resin, polystyrene resin, styrene-acrylonitrile copolymer resin, polyvinylbutyral resin, cellulose acetate resin, and polyester resin and the thickness of the cured coating film is 0.003 –2.0 mm.

5. A transparent resin composite comprising a substrate of a transparent plastic material coated with a cured film of at least one [(2,3-epoxypropoxy)alkyl]trialkoxysilane represented by the general formula: represented by the general formula:



whereby R is an alkylene group containing up to 4 carbon atoms and R' is an alkyl group containing up to 4 carbon atoms, and a transparent polymer which is compatible with [(2,3-epoxypropoxy)propyl]trialkoxysilanes.

6. The transparent composite resin material as claimed in claim 5, wherein R of the general formula is one of methylene, ethylene and trimethylene and R'is one of methyl, ethyl, n-propyl, and n-butyl; the transparent polymer compatible with [(2,3-epoxypropoxy)alkyl]trialkoxysilane is selected from a class consisting of polystyrene, poly(lower-alkyl acrylate), poly(lower-alkyl methacrylate), poly(gylcidyl methacrylate), cellulose nitrate, and cellulose acetate and the transparent plastic material of the substrate is selected from a class consisting of poly(vinyl chloride) resin, poly(lower-alkyl acrylate) resin, poly(lower-alkyl methacrylate) resin, poly(diethyleneglycol bis(allyl carbonate)) resin, polystyrene resin, styrene-acrylonitrile copolymer resin, polyvinylbutyral resin, cellulose acetate resin and polyester resin, and the thickness of the cured coating film is 0.003 – 2.0 mm.

3,955,036
PRIMER COMPOSITIONS

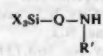
Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 216,769, Jan. 10, 1972, Pat. No. 3,808,018. This application Nov. 19, 1973, Ser. No. 417,017
Int. Cl.² B32B *15/08, 17/10, 25/08*
U.S. Cl. 428—429 **7 Claims**

1. An article of manufacture comprising a solid substrate having on the surface thereof a coating of a primer composition consisting essentially of

a. 80 to 99.99 weight percent of a tackifier component consisting essentially of resin having a molecular weight of no more than 12,000, said resin being selected from the group consisting of natural or modified rosin, esters of natural or modified rosin, polyterpenes, coumaroneindene resins and modified coumarone-indene resins, polycyclopentadiene, aliphatic hydrocarbon resins and chlorinated aliphatic hydrocarbon resins, polystyrene and copolymers of styrene with at least one ethylenically unsaturated aromatic monomer, phenolic and modified phenolic resins and chlorinated terphenyl or diphenyl resins having a chlorine content of about 42 to 64 weight percent; and

b. 0.01 to 10 weight percent of an organosilicon compound of the general formula



partial condensates thereof and hydrochloride salts thereof in which

X is the hydroxyl group or a hydrolyzable radical;

Q is a divalent hydrocarbon radical or a substituted divalent hydrocarbon radical containing nitrogen in the form of one or more

groups wherein R is a hydrogen atom, a lower alkyl group containing from 1 to 6 inclusive carbon atoms or the phenyl radical; and

R' is selected from the group consisting of the hydrogen atom, monovalent hydrocarbon radicals containing from 1 to 18 inclusive carbon atoms and substituted monovalent hydrocarbon radicals containing from 1 to 18 inclusive carbon atoms,

and, in contact with said coating of primer composition, an unvulcanized thermoplastic elastomer consisting essentially of a liner polymer having a glass transition temperature (Tg) of less than 0°C. and a molecular weight of at least 20,000, said primer composition being partially, but not completely, compatible with said unvulcanized elastomer.

3,955,037
MAGNETIC DISCS HAVING A MULTI-COMPONENT BINDER

Matthias Marx, Bad Duerkheim; Job-Werner Hartmann, Ludwigshafen, and Werner Ostertag, Oberer-Bergel-Weg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigahsfen (Rhine), Germany

Filed Nov. 6, 1974, Ser. No. 521,459
Claims priority, application Germany, Nov. 8, 1973, 2355849
Int. Cl.² H01F *10/02*
U.S. Cl. 428—418 **7 Claims**

1. A process for the manufacture of magnetic discs by applying a thin layer of a fluid dispersion of finely divided magnetic pigment in a binder, containing added volatile organic solvents and, optionally, conventional additives, to the non-magnetic base disc and drying the magnetic layer applied and subsequently grinding and polishing its surface, wherein the binder used consists essentially of a curable mixture of

A. from 60 to 90 percent by weight of a solid curable polycondensate of 2,2-bis-(4-hydroxyphenyl)-propane and epichlorohydrin with an epoxide equivalent weight of approximately 400 to 5,000,

B. from 5 to 25 percent by weight of a curable allyloxybenzene-formaldehyde condensate of the resol type with free or alcohol-etherified methylol groups and having a molecular weight of less than 1,000 and

C. from 5 to 30 percent by weight of a curable melamine-formaldehyde condensate with more than two alcohol-etherified methylol groups and a molecular weight of less than 3,000,

in which from 10 to 35 percent by weight of the component A are replaced by

D. a free-radical polymerization product of

D 1. at least 10 percent by weight of a reaction product of (d1) a polycondensate, containing epoxy groups, of 2,2-bis-(4-hydroxyphenyl)-propane and epichlorohydrin with (d2) the N-methylolamide of a copolymerizable olefinically unsaturated carboxylic acid of 3 to 5 carbon atoms; and

D 2. 0 to 90 percent by weight of at least one olefinically unsaturated monomer selected from the group consisting of alkyl esters of acrylic or methacrylic acid with from 1 to 20 carbon atoms in the alkyl radical, vinylaromatic compounds, hydroxyalkyl acrylates or methacrylates, N-methylolamides of olefinically unsaturated carboxylic acids of 3 to 5 carbon atoms and the ethers of said N-methylolamides with aliphatic alcohols.

3,955,038

HARD METAL BODY

Jan Nils Lindstrom, Hagersten; Bo Folke Jonsson, Huddinge, and Fall Johan Olof William Ohlsson, Enskede, all of Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Apr. 9, 1973, Ser. No. 349,125

The portion of the term of this patent subsequent to Sept. 24, 1991, has been disclaimed.

Int. Cl.² C23C *11/14*, *13/02*; C23D *5/00*

U.S. Cl. 428—457 **2 Claims**

1. An article consisting of
1. a substrate body of sintered cemented metal carbide containing a small quantity of binder metal;
2. an intermediate layer of metal selected from the group consisting of metal carbides and metal nitrides; and
3. a thin wear-resistant surface coating consisting essentially of at least one layer of wear-resistant ceramic oxide, the thickness of said surface coating being 0.5–4.0 μm, and the thickness of said intermediate layer being 2–16 times that of said surface coating.

3,955,039

ALUMINUM TANTALUM LAYERS FOR ELECTRONIC DEVICES

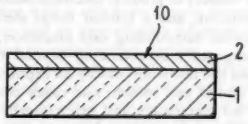
Manfred Roschy, Munich, and Alois Schauer, Grunwald, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 19, 1973, Ser. No. 408,100

Claims priority, application Germany, Oct. 31, 1972, 2253490

Int. Cl.² B05D *5/12*

U.S. Cl. 428—457 **2 Claims**



1. An aluminum-rich Al-Ta alloy film for electrical devices, such as thin-layer circuits, discrete resistors, capacitors and the like on a non-conductive substrate, said film being characterized as having a resistivity in micro ohm centimeters of about 60, having a sparking potential in 0.1% H_3PO_4 of about 400 volts, being temperature-stable and oxidation-resistant in air at a temperature of about 500° C., said Al-Ta alloy containing about 7 atomic % Ta and having a *fcc* Al-lattice structure.

3,955,040

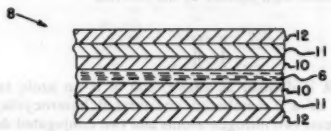
POLYAMIDE FILM LAMINATE WITH ENTRAPPED LIQUID

Henry George Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 327,358, Jan. 29, 1973, Pat. No. 3,874,967. This application May 24, 1974, Ser. No. 473,106

Int. Cl.² B32B *27/34*

U.S. Cl. 428—474 **5 Claims**



1. A polyamide film laminate comprising:
a. a laminated, stretched, flattened tube, said flattened tube including:
1. an inner layer of a liquid permeable, polymeric material selected from the group consisting of an ethylene vinyl acetate copolymer or an ethylene acrylic acid copolymer,
2. a polyamide layer adjacent said inner layer and disposed outwardly thereof; and,
b. a layer of treating liquid entrapped by said inner layer of permeable material and forming a central layer in the laminate resulting from said flattened tube, said liquid being diffusible through said permeable layer to the surface of said polyamide layer and said layers being insoluble in said treating liquid.
2. The laminate of claim 1 wherein said liquid is water.

3,955,041

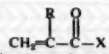
LATEX COMPOSITIONS CONTAINING POLYMERS HAVING REACTIVE AZOLIDE CURE SITES

Harold A. Tucker, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 460,825, April 15, 1974, Pat. No. 3,912,682. This application July 23, 1975, Ser. No. 598,356
Int. Cl.² B32B *23/08, 27/10*
U.S. Cl. 428—511 **7 Claims**

1. An article comprising nonwoven fibers bound with a polymeric composition containing (A) a polymer consisting essentially of interpolymerized units of (1) from about 50 percent to about 99.5 percent by weight of an acrylic ester monomer of the formula

wherein R is hydrogen, or a methyl or ethyl radical and R_a is selected from the group consisting of alkyl radicals containing 1 to about 24 carbon atoms and alkoxyalkyl radicals containing 2 to about 12 carbon atoms total in the radical, (2) from about 0.5 percent to about 50 percent by weight of ana ethylenically unsaturated azolide of the formula



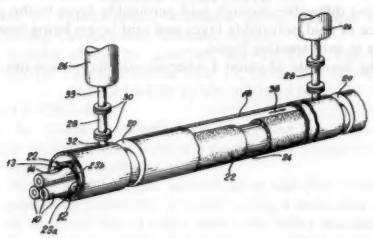
wherein R is defined as above, and X is an azole radical comprised of a 5-membered unsaturated heterocyclic ring having at least two nitrogen atoms and two conjugated double bonds contained therein, where the carbonyl structure is directly attached to a nitrogen atom of the azole, and (3) up to 20 percent by weight of a copolymerizable vinylidene monomer, selected from the group consisting of styrene, α-methylstyrene, acrylonitrile, acrylamide, vinyl acetate, vinyl chloride, vinylidene chloride, butadiene, and isoprene, and (B) from about 0.5 part to about 10 parts by weight based upon 100 parts by weight of polymer in the latex of a di- or polyfunctional amine.

3,955,042

COOLING OF POWER CABLES BY A CLOSED-CYCLE EVAPORATION-CONDENSATION PROCESS

Mazin Kellow, Longueil; James Vansant, Chambly, and Jacques Bonneville, St-Bruno, all of Canada, assignors to Hydro-Quebec Institute of Research, Darennen, Canada

Filed Sept. 30, 1974, Ser. No. 510,657
Int. Cl.² H01B *7/34*
U.S. Cl. 174—15 C **6 Claims**



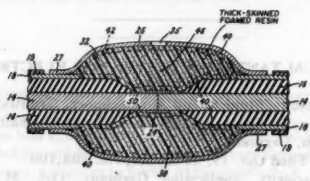
1. An apparatus for cooling underground power cables with a volatile fluid comprising: an elongated enclosed chamber; an enlongated layer of porous material defining therewithin a space for receiving a power cable, said layer being disposed lengthwise within said enclosed chamber, said layer having an upper portion and a lower portion, each of said portions running along the entire length of said layer, said lower portion being so disposed in said enclosed chamber as to contact a liquid phase of volatile fluid in said enclosed chamber, said upper portin being so disposed in said enclosed chamber as to be spaced from the liquid phase of volatile fluid; an enclosed heat exchanger connected to the enclosed chamber at a connection point, said connection point and said enclosed heat exchanger being located above the liquid phase of volatile fluid within the enclosed chamber, whereby uniform distribution of the volatile fluid in the liquid phase over the surface of the porous layer by capillary action is obtained, whereby the liquid is evaporated within the enclosed chamber by heat generated within the power cables, whereby the evaporated liquid is transferred by virtue of a pressure differential from the enclosed chamber to the enclosed heat exchanber, and whereby the evaporated liquid is condensed in the heat exchanger, and flows by gravity back to the enclosed chamber.

3,955,043

HIGH VOLTAGE CABLE SPLICE USING FOAM INSULATION WITH THICK INTEGRAL SKIN IN HIGHLY STRESSED REGIONS

Philip J. Palmer, Philadelphia, and J. Kenneth Wittle, Berwyn, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Apr. 11, 1974, Ser. No. 460,236
Int. Cl.² H01R *5/00*
U.S. Cl. 174—84 R **7 Claims**



1. A splice for joining two sections of high voltage cable, each comprising: a conductor adapted to operate at a high voltage with respect to ground, electrical insulation surrounding the conductor, and a tubular metal sheath normally at ground potential surrounding said insulation, the conductor having an exposed end extending beyond the end of said insulation and the insulation having an exposed end extending beyond the end of said sheath; said splice comprising:

a. means for electrically and mechanically joining the exposed ends of the two conductors,

b. a housing normally at substantially ground potential surrounding the adjacent ends of said cable sections and providing a cavity that surrounds the adjacent ends of said sheaths, said exposed insulation ends, and said conductor ends,

c. a tubular section of insulant filling said cavity and in intimate contact with the cable parts within said cavity that are exposed to said insulant, said tubular section of insulant serving as primary insulation in said splice for withstanding voltage between said high voltage conductors and said grounded housing,

d. said insulant being a rigid closed-cell foam of the type that is formed from constituents that when reacted in a mold 4 inches by 4 inches by 2 inches to produce a foam body having an overall density of 15 pounds/ft.³, will produce a foam body having at all its surfaces in contact with the mold a thick integral skin having an average density of at least 40 pounds/ft.³ in its outer 1/16 inch,

e. said tubular section of insulant being foamed in place within said cavity so that the surfaces of the splice ex-

posed to said foam and located within said cavity act as a mold therefor, thus providing a thick integral skin in the region of said tubular section that borders all of said exposed surfaces,

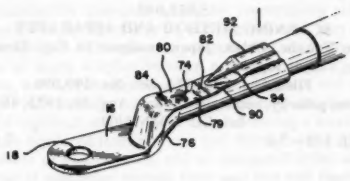
f. the integral skin on said tubular section of insulant having an average density of at least 40 pounds/ft.^{3} in its outer 1/16 inch.

3,955,044

CORROSION PROOF TERMINAL FOR ALUMINUM WIRE

Ronald Clarence Hoffman, Williamstown; Timothy Allen Lemke, Mechanicsburg, and Robert Charles Swengel, Sr., York, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 3, 1970, Ser. No. 94,653
Int. Cl.^{2} H02G *15/08*
U.S. Cl. 174—84 C **21 Claims**



1. A crimped, corrosion-proof terminal connection, comprising: a terminal having a wire barrel portion, an insert within said wire barrel portion, an aluminum wire having an end portion received within said insert, with said wire barrel portion, said insert and said aluminum wire end portion being crimped together with a relatively deeply depressed forward crimped portion and an immediately adjacent relatively less deeply depressed rearward crimp portion,

said deeply depressed crimp portion including a projecting portion formed by an extruded portion of said wire barrel,

said insert being provided with a plurality of perforations to accept therein extruded portions of said wire and of said terminal,

said terminal including portions extruded into said insert perforations at said relatively deeply depressed crimp portion,

said wire at said deeply depressed crimp portion including portions extruded into said perforations of said insert and in electrical contact with said extruded portions of said terminal,

said wire extruded portions having an oxide layer thereon being purposely broken upon extrusion at said relatively deeply depressed crimp portion to establish the electrical contact with said terminal,

said terminal and said insert and said wire in intimate contact thereby preventing reoxidation of said wire extruded portions and thereby preventing corrosion internally of said connection,

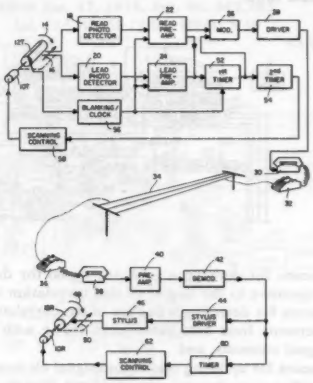
a reservoir internally of said wire barrel portion forwardly of said insert, said deeply depressed forward crimp portion being substantially elongated in a forward direction during crimping and said wire conductor being longitudinally extruded within said elongated forward crimp portion and substantially filling both said elongated forward crimp portion and said reservoir.

3,955,045

METHOD AND APPARATUS FOR TIME COMPRESSION OF FACSIMILE TRANSMISSIONS

Herbert P. Ford, Jr., Orlando, Fla., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 8, 1974, Ser. No. 449,514
Int. Cl.^{2} H04N *1/12, 7/12*
U.S. Cl. 178—6 **35 Claims**



1. A facsimile transmitter for transmitting signals to a remote location representing dark-light variations in a document at said transmitter, said transmitter comprising:

optical sensor means in optical communication with said document;

signal generating means coupled and responsive to said optical sensor means for generating video signals representing light and dark regions on said document;

signal transmitting means coupled to said signal generating means for generating transmission signals from said video signals representing the sensing of said light and dark regions on said document;

scanning means for moving said optical sensor means relative to said document at a slow scanning rate and a fast scanning rate; and

scanning rate control means including timing means coupled to said signal generating means and said scanning means for automatically initiating said fast scanning rate when the timed period between signals representing dark regions on said document as determined by said timing means exceeds a predetermined period and automatically reinstating said slow scanning rate when said optical sensor means senses a dark region, said timing means being reset by said video signals representing dark regions.

3,955,046

IMPROVEMENTS RELATING TO AUTOMATIC TARGET FOLLOWING APPARATUS

William Ellis Ingham, Ealing, and Gordon William Newbery, Stoke Poges, both of England, assignors to E M I Limited, Hayes, England

Filed Apr. 26, 1967, Ser. No. 637,032
Claims priority, application United Kingdom, Apr. 27, 1966, 18548/66
Int. Cl.^{2} H04N *3/00*
U.S. Cl. 178—6.8 **7 Claims**

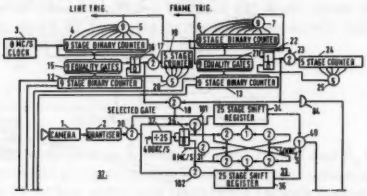
3. Automatic target following apparatus comprising

a. sensing means for deriving a video signal representing a target,

b. means for storing signal elements from a frame of said video signal,

c. means for comparing signal elements from a subsequent frame of said video signal with the stored signal elements with different relative phase shifts to detect deviation from a desired point of view of the target,

d. said comparing means including means for deriving a plurality of correlation signals dependent on the correlations of the signal elements from said subsequent frame and said stored signal elements with different relative phase shifts,



e. means for deriving a guidance signal for the apparatus responsive to the largest of said correlation signals,

f. means for detecting a decline in the correlation of signal elements from said subsequent frame with said stored signal elements, and

g. means for updating said stored signal elements when the decline exceeds a pre-arranged limit, thereby to allow for changes in the relative size of the target with approach of the appartus thereto.

3,955,047

D.C. REINSERTION IN VIDEO AMPLIFIER

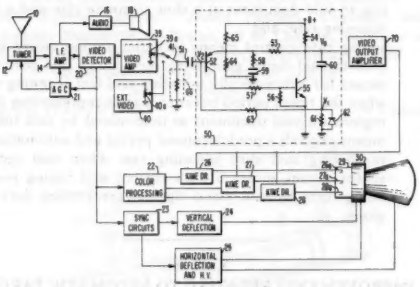
Donald Henry Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 1, 1974, Ser. No. 511,311

Claims priority, application United Kingdom, Apr. 16, 1974, 16653/74

Int. Cl.² H04N *5/16*; H03F *1/34*

U.S. Cl. 178—7.3 DC **11 Claims**



1. A video amplifier, comprising:

amplifying means having an input terminal, a feedback terminal, an output terminal and a direct current coupling between said input terminal and said output terminal;

negative feedback means coupled between said output terminal and said feedback terminal for coupling a first predetermined portion of an alternating current component of said output signal and a second predetermined portion, independent of said first predetermined portion, of a direct current component of said output signal to said feedback terminal, said amplifier means having a relatively high open loop gain such that the respective D.C. and A.C. closed loop gains of the combination of said amplifying means and said feedback means is substantially determined by said feedback means;

a source of video signals having video information disposed between synchronization pulses;

first capacitive means for coupling said source of video signals to said input terminal;

means for clamping maximum signal excursions in the direction of said synchronization pulses to a reference voltage, said clamping means including a source of reference voltage and a series connection of a second capacitive means and a unidirectional coupling device, poled to conduct in response to said synchronizing pulses, directly connected between said output terminal and said source of reference voltage; and

means for direct current coupling signals developed at the junction of said second capacitive means and said unidirectional coupling device to said input terminal with the same polarity as said input signals to develop at said input terminal a direct voltage substantially equal to the average voltage of said output signal when said synchronizing pulses are clamped to said reference voltage.

3,955,048

SCANNING METHOD AND APPARATUS

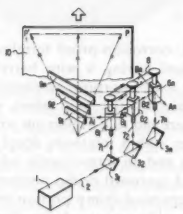
Minoru Tanabe, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1974, Ser. No. 499,996

Claims priority, application Japan, Aug. 30, 1973, 48-96660

Int. Cl.² H04N *1/04*

U.S. Cl. 178—7.6 **7 Claims**



1. Apparatus for scanning a moving document comprising

means for projecting a beam of light;

means for dividing the beam of light into a plurality of divided light beams; and

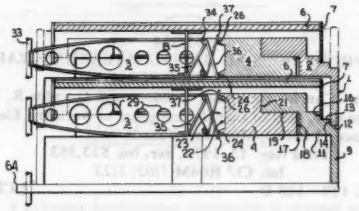
scanning means for successively scanning the divided light beams over a common area adjacent said moving document so that as said document passes said common area, successive portions thereof are scanned until the entirety of said document is scanned

said scanning means including n rotating reflecting means respectively responsive to said divided light beams for respectively scanning the divided light beams across said common area, each rotating reflecting means including a plurality of reflecting surfaces disposed about its axis of rotation where the axes of rotation of said rotating reflecting means are displaced from and substantially parallel with one another and where the reflecting surfaces of each rotating reflecting means are so angularly disposed with respect to the reflecting surfaces of the rotating reflecting means adjacent thereto that the divided light beams are successively scanned across said common area.

3,955,049
PRINTING HEAD

John H. MacNeill, Indialantic, and James E. Bellinger, Melbourne, both of Fla., assignors to Florida Data Corporation, Melbourne, Fla.

Filed Dec. 4, 1974, Ser. No. 529,544
Int. Cl.² H04L 21/00; H04R 17/00
U.S. Cl. 178—30 20 Claims

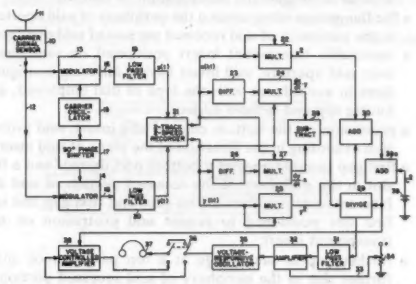


2. A driver for a stylus, needle or the like comprising a thin, flat, piezoelectric element, means for constraining said element such that in response to an exciting voltage a part of said element flexes in a direction perpendicular to the plane of said element to move a stylus between printing and non-printing positions, a beam, flexure means for securing one end of said beam for substantially pivotal movement only relative to an unflexed region of said element, means securing a location on said beam displaced from said one end thereof to the approximate center of said element, and an elongated stylus secured to an end of said beam remote from said one end thereof for movement parallel to the elongated axis of said stylus.

3,955,050
SYSTEM FOR AUDIBLY RECOGNIZING AN AURALLY UNCLASSIFIABLE SIGNAL

Michael J. DiToro, Massapequa, N.Y., assignor to General Signal Corporation, New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,267
Int. Cl.² G10L 1/00; G01D 21/04
U.S. Cl. 179—1 SA 6 Claims

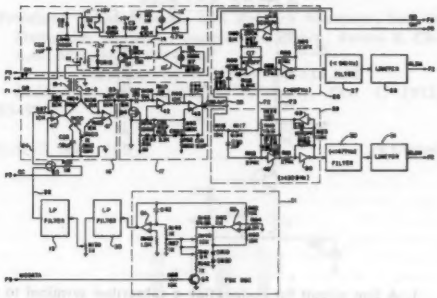


1. A system for audibly recognizing a received signal aurally unclassifiable because of its improper time duration and/or the frequency band occupied thereby comprising:
- a signal-storage device;
- means for storing the signal in said device as received;
- means for retrieving the signal from said device at a time-rate differing from the storing rate;
- means for developing a control signal varying in magnitude with the weighted instantaneous frequency of said retrieved signal;
- and an adjustable-frequency audible-tone generator responsive to said control signal;
- said generator having an output circuit effective to supply an audible signal representative of the received signal.

3,955,051
DATA SET WITH BRIDGE FOR DUPLEX OPERATION

Jack J. Bitzer, Santa Cruz, and Alton T. Jobes, Jr., Santa Clara, both of Calif., assignors to Plantronics, Santa Cruz, Calif.

Filed Jan. 17, 1975, Ser. No. 541,783
Int. Cl.² H04M 11/00; H04L 5/14
U.S. Cl. 179—2 DP 13 Claims



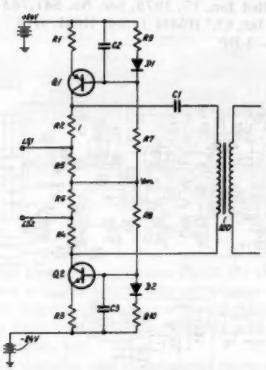
2. Data communication apparatus including a data terminal, a data channel and a data set where the data set connects the data terminal to the data channel, said data set comprising,
- first amplifier means having an output for providing a signal to be transmitted over the data channel and for isolating the signal to be transmitted from a signal received from the data channel,
- second amplifier means having first and second differential inputs and having an output,
- network means including,
  - first, second, third and fourth legs where said first and second legs are connected in series from said output of said first amplifier means to said first input of said second amplifier means, where said third and fourth legs are connected in series from said output of said first amplifier means to said second input of said second amplifier means,
  - connection means for connecting said data channel, having a channel impedance, to said network means at a point between said first and second legs,
  - balancing means including a reactance, forming a balancing impedance equal to said channel impedance, for connecting a reference to said network means at a point between said third and fourth legs,
  - said first and second legs, as coupled by said channel impedance, conducting a first component of said signal to be transmitted to said first input of said second amplifier and said third and fourth legs, as coupled by said balancing impedance, conducting a second component of said signal to be transmitted to said second input of said second amplifier means whereby said first and second components of said signal to be transmitted are of substantially equal amplitude and phase and are therefore canceled in said second amplifier means,
  - said first and third legs and said balancing means providing a conduction path for said signal received from the data channel and said second and fourth legs conducting unequal components of said signal received from the data channel to the first and second inputs of said second amplifier whereby said signal received from the data channel is output from said second amplifier and is isolated from said signal to be transmitted.

3,955,052

SUBSCRIBER UNIT PARTICULARLY USEFUL FOR TIME-DIVISION-MULTIPLEX SYSTEM

Shelomo Orbach, Haifa, Israel, assignor to Tadiran Israel Electronics Industries Ltd., Tel Aviv, Israel

Filed Nov. 18, 1974, Ser. No. 517,532
Int. Cl.² H04Q 1/28
U.S. Cl. 179—18 FA 7 Claims



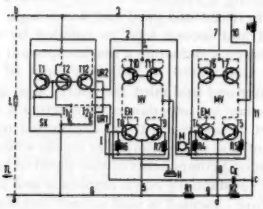
1. A line circuit for connecting a subscriber terminal to a signal transmission network including a direct current supply for driving the subscriber terminal and a line transformer connecting the subscriber terminal to the signal transmission network with the line between the line circuit and the subscriber terminal having two wires; characterized in that the direct current supply is a constant direct current supply, including a pair of symmetrical constant direct current sources, each coupled to one of said two wires and a feedback loop; and a capacitor in the line circuit for blocking the passage of the constant direct current through the line transformer.

3,955,053

INTEGRATED CIRCUIT ARRANGEMENT FOR A TELEPHONE SUBSCRIBER STATION

Peter Picard, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 293,451, Sept. 29, 1972, abandoned.
This application Aug. 8, 1974, Ser. No. 495,801
Claims priority, application Germany, Sept. 30, 1971, 2148929
Int. Cl.² H04M 1/58
U.S. Cl. 179—81 A 1 Claim



1. In a circuit arrangement for a telephone subscriber station having a microphone amplifier and a receiving amplifier, said amplifiers being connected in different diagonals of an impedance bridge circuit, the improvement comprising:

two differential amplifiers constructed in integrated circuit form, one of said differential amplifiers being said microphone amplifier and the other differential amplifier being said receiving amplifier,

constant current source means for producing two independent constant currents and including means for deriving independent reference voltages from said constant currents and

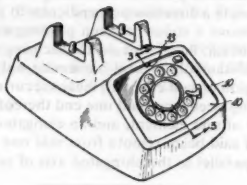
means for connecting one of said reference voltages to said one differential amplifier and for connecting the other of said reference voltages to said other differential amplifier.

3,955,054

TELEPHONE HOUSING HAVING INTERCHANGEABLE DIAL FACE INSERTS

Raymond Charles Hemming, London, and Quentin R. Ball, Westmount, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Nov. 13, 1974, Ser. No. 523,353
Int. Cl.² H04M 1/02, 1/23
U.S. Cl. 179—100 D 7 Claims



1. A telephone housing including

a dial face, said dial face recessed for a major portion thereof;

an aperture in said recessed portion said aperture adapted to receive one of a pushbutton dial and a rotary dial without consequential modification to said dial face;

a flat flange extending around the periphery of said aperture to the periphery of said recessed portion of said dial face;

a removable transparent insert positioned on said flange over said aperture, said insert having differing configurations in accordance with the type of dial employed, and having top and bottom edges;

a protrusion on the bottom edge of said insert, said protrusion extending in the direction of the plane of said insert;

a first gap in said flange at a bottom part thereof and a first slot in the periphery of the recessed portion of said dial face coincident with said first gap, said first gap and said first slot positioned to accept said protrusion on said transparent insert;

a further gap in said flange at a top part thereof and a further slot in the periphery of said recessed portion of said dial face coincident with said further gap;

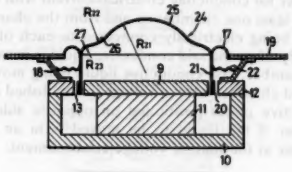
a further removable insert substantially of the same configuration as said transparent insert, positioned beneath said transparent insert and visible therethrough;

a resilient clip attached to the interior of said housing adjacent to said further gap, said clip including an end portion extending through said further slot and overlying the edge of said transparent insert, the arrangement such that deflection of said clip will move said end portion out of overlying engagement with said transparent insert to permit said transparent insert, and said further insert, to be lifted at a position adjacent to said clip and moved to disengage said protrusion from said first slot.

3,955,055
DYNAMIC LOUDSPEAKER

Hirotake Kawakami, Tokyo, and Hiroshi Koizumi, Ohmiya, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 20, 1975, Ser. No. 542,378
Claims priority, application Japan, Jan. 31, 1974, 49-13549
Int. Cl.² H04R 9/06
U.S. Cl. 179—115.5 R 2 Claims

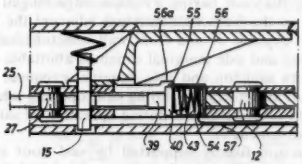


1. A dynamic loudspeaker comprising a magnet and yoke forming a magnetic circuit, an air gap in said magnetic circuit, a voice coil disposed in said air gap, and a diaphragm mechanically connected to said voice coil, said diaphragm including a first curved surface with predetermined radius of exterior curvature at its central portion, a second curved surface with predetermined radius of interior curvature, contiguous to said first curved surface, and a third curved surface with predetermined radius of exterior curvature contiguous to said second curved surface, the radius of exterior curvature of said first curved surface being larger than the radius of interior curvature of said second curved surface, the radius of exterior curvature of said third curved surface being smaller than the radius of interior curvature of said second curved surface, said first curved surface providing a principal dome-shaped central part of said diaphragm, and said voice coil being connected to said third curved surface.

3,955,056
SAFETY BELT BUCKLE PROVIDED WITH ELECTRIC CONTACT

Stig Martin Lindblad, 440 20 Vargarda, Sweden

Continuation-in-part of Ser. No. 273,777, July 21, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 451,905
Claims priority, application Sweden, Aug. 3, 1971, 9905/71
Int. Cl.² H01H 3/16; A44B 11/26; B60Q 1/00
U.S. Cl. 200—61.58 B 3 Claims

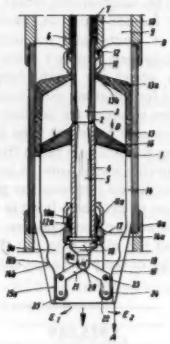


1. A safety belt buckle comprising a buckle casing to be connected to one part of the safety belt assembly, a spring loaded locking member moveably mounted in said buckle casing, a tongue connected to another part of the safety belt, said tongue being insertable into said buckle casing and having a configuration whereby said tongue moves said member against the action of its spring until said locking member snaps into its locking position in and retains said tongue, manually operable means being provided for moving said locking member to release said tongue, spring biasing means capable of ejecting said tongue when released from said buckle casing, an electric switch in said buckle casing comprising a first electric contact member being moveably positioned for being moved between three positions by said tongue and said spring biasing means, a second contact member being fastened to said buckle casing, electric insulating means electrically insulating said first electric contact member from said buckle casing, a first position of said three positions having said two contact members interconnected when said tongue is in its released position, a second of said positions having said two contact members disconnected when said tongue is in its normal locked position and a third of said positioned having said two contact members being interconnected when said tongue is pressed further inwards against said spring biasing means.

3,955,057
ELECTRIC SWITCH

Friedhelm Dabringhausen, and Heinrich Neumaier, both of Mannheim, Germany, assignors to Brown, Boveri & Cie. A.G., Mannheim, Germany

Filed Sept. 30, 1974, Ser. No. 510,558
Claims priority, application Germany, Oct. 1, 1973, 2349331
Int. Cl.² H01H 33/88
U.S. Cl. 200—148 A 19 Claims



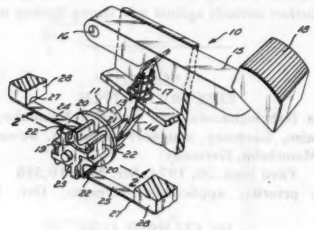
1. Electric switch comprising a fixed contact member and a movable contact member movable from a position wherein it is in contact with said fixed contact member to a position wherein it is spaced therefrom, one of said members having a nozzle-like inner channel, a blast piston-cylinder assembly surrounding said contact members in said contact position thereof wherein the switch is in switched-on condition, said cylinder and said piston being displaceable relatively toward one another in said switched-on condition of the switch so as to compress a gas received in the space between said piston and said cylinder, said fixed and movable contact members in said spaced position thereof, during switch-off of the switch, having an arc therebetween, said arc being blown by an extinguishing flow through said nozzle-like inner channel of the gas compressed by said piston and cylinder assembly, said piston having a base secured to said movable contact member drive means for substantially uniformly actuating only said cylinder, the compressive force of the compressed gas on said piston base driving said movable contact member into switched-OFF position of the switch, and means located between said cylinder and said movable contact member for controlling the course of travel of said movable contact member relative to that of said cylinder.

3,955,058

RATCHET SWITCH

James L. Alfrey, Kokomo, Ind., assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed Sept. 27, 1974, Ser. No. 509,842
Int. Cl.² H01H 17/08
U.S. Cl. 200—156 **8 Claims**



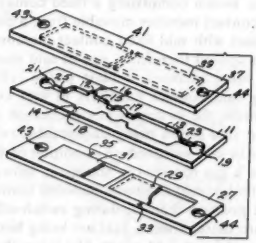
1. A ratchet switch comprising a ratchet wheel rotatably mounted within a housing, pawl means within said housing for driving said ratchet wheel in a first direction, a rotatable switch wheel driven by said ratchet wheel, said switch wheel comprising a wheel formed from an insulating material and having a plurality of electrically connected contact plates spaced about its periphery, contact arms flexed and biased against said switch wheel for establishing a circuit across contacted plates and for breaking said circuit when said wheel is moved to a position wherein the contact arms contact insulating spaces between said plates, at least a portion of each of said arms comprising a cantilever beam fixed at one end, free at the other, and curving away from its contact plate from a line of tangency established between the plate and the beam, any remaining portion of each arm lying in substantially parallel relationship with each plate, said line of tangency being closer to the edge of the plate adjacent the fixed end of the beam than to the edge of the plate adjacent the free end of the arm.

3,955,059

ELECTROSTATIC SWITCH

Ronald E. Graf, 9401 Union Place, Gaithersburg, Md. 20760

Filed Aug. 30, 1974, Ser. No. 502,224
Int. Cl.² H01H 57/00
U.S. Cl. 200—181 **10 Claims**



1. An electrostatic switch comprising a dielectric structure having a plurality of chambers formed therein, each of said chambers being joined to at least one other chamber of the group by a constricted region between said pair of chambers, the volume of said constricted region or regions being substantially smaller than said chambers,

a pair of conductive plates positioned on opposite sides of each of said chambers,

electrical insulation covering each of said conductive plates,

a conductive liquid positioned within one of said chambers and extending somewhat beyond the chamber when no voltage is applied to the system so that said liquid is also between the plates associated with any chamber adjoining through a constricted region,

means for establishing a voltage across the conductive plates of any one of said chambers,

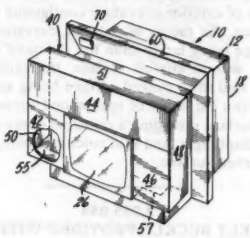
means positioned at a plurality of points in said at least one chamber for conducting electrical current with respect to said at least one chamber to and from the chamber, said means being electrically connected to each other when and only when the said conductive liquid is in said at least one chamber, said conductive liquid being moved into a selected chamber when a voltage is established across the conductive plates positioned on opposite sides of said chamber if the liquid to be moved is in an adjoining chamber at the time of voltage establishment.

3,955,060

MICROWAVE OVEN CONSTRUCTION

Tibor S. Laszlo, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 14, 1974, Ser. No. 497,184
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 D **8 Claims**



1. A microwave oven comprising

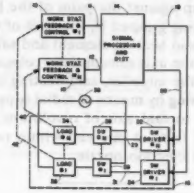
a housing enclosing a space for receiving an article to be heated with microwave energy, said housing including opposed top and bottom walls, a rear wall, a pair of side walls and front wall structure, said front wall structure having an opening therein and having top, bottom and side marginal expanses bordering said opening, and a generally flat door having a bottom edge hinged to said housing on the front wall structure adjacent the bottom marginal expanse of said front wall structure, said door having top and side marginal expanses abuttable respectively with said top and side marginal expanses of said front wall structure for closing said opening when said door is in closed position during operation of said oven, the improvement of

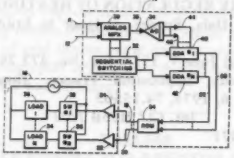
shield structure fixedly supported by said door spacedly from such abutting marginal expanses of said door and said front wall structure when said door is in said closed position, said shield structure including a first portion extending generally parallel to the front wall structure of said housing to locations above the top wall of said housing and beyond the side walls of said housing, and a second portion extending rearwardly of the front wall structure of said housing from said first portion a predetermined distance alongside said housing side walls and top wall; said first and second portions being connected together in unitary structure to define a contiguous reflector for reflecting rearwardly of said housing front wall structure any microwave energy radiation which may escape from said abutting marginal expanses of said door and said front wall structure when said door is in said closed position, during operation of said oven.

3,955,061
HIGH FREQUENCY POWER DISTRIBUTION AND CONTROL SYSTEM

Kenneth E. Roehrman, Litchfield Park, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Aug. 5, 1974, Ser. No. 494,788
Int. Cl.² H05B *5/04;* **H02J** *3/14*
U.S. Cl. 219—10.77 **9 Claims**





1. A power distribution system for asynchronously supplying power from a generator operating at a frequency substantially higher than 60 cycles per second to a plurality of connected loads on a time-sharing basis comprising:

a. first means for providing a digital signal indicative of the power demand into a particular load,

b. second means connected to said first means for providing a pulse modulated signal,

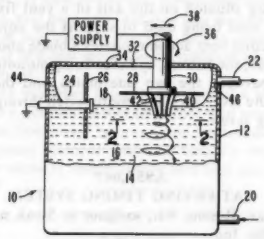
c. third means connected to said second means for selecting one of said plurality of loads,

d. semiconductor switching means connected to said third means and the generator and responsive to said pulse modulated signal for connecting the generator to one of said loads at an exact integer cycle, i.e., 0°, 180°, 360°.

3,955,062
ARC SAW COOLING AND DUST COLLECTION SYSTEM

Max P. Schlienger, San Rafael, Calif., assignor to Schlienger, Inc., San Rafael, Calif.

Filed Nov. 25, 1974, Ser. No. 527,094
Int. Cl.² B23K *9/00*
U.S. Cl. 219—68 **20 Claims**

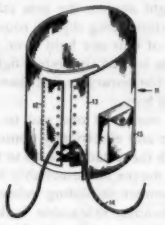


1. An arc saw cutting apparatus comprising: means defining a chamber having an upright wall, an inlet and an outlet for the chamber for permitting a fluid flow through the chamber and to allow the fluid to reach a predetermined level in the chamber; means in the chamber for mounting a workpiece to be cut; an arc saw; means mounting the arc saw for rotation and for movement toward the workpiece when the latter is mounted in the chamber whereby an arc established between the workpiece and the arc saw will cause the workpiece to be cut; and means in said chamber for imparting to the fluid in the chamber a circulatory flow so that the fluid rises along the chamber wall above the predetermined level and above the arc saw into fluid communication with said outlet to thereby form a fluid curtain surrounding the arc saw.

3,955,063
WARMED SHIELD TO DIRECT STRIKES OF SNAKES

Raymond D. Berger, 1504-40th Ave. Court, Rock Island, Ill. 61201

Filed Feb. 10, 1975, Ser. No. 548,884
Int. Cl.² H05B *1/00*
U.S. Cl. 219—211 **2 Claims**



1. An electrically warmed shield to be worn by a person for directing the strikes of venomous snakes comprising:

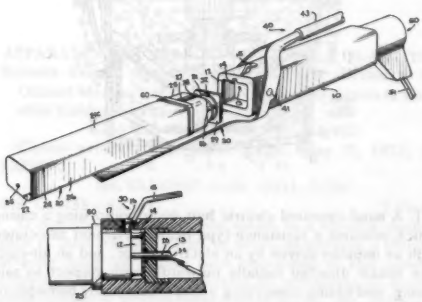
a flexible hard band, means for securing said band about the limb of a person to form thereabout a closed cylindrical heat-reflecting wall impervious to the fangs of snakes,

an electrical heating element, and means for securing said heating element to that surface of said band adapted to face outwardly from a limb to which said band is to be secured, said heating element adapted to be heated for radiating directly therefrom and by reflection from said band in a direction outwardly from a limb to which the band is attached sufficient heat to direct strikes of venomous snakes to said band and thereby to protect the person wearing said warmed shield.

3,955,064
HAIR STYLING IRON HAVING INTERCHANGEABLE HEATING TIPS

Concetto Bruno Demetrio; Martin Apelbaum, both of New York, N.Y., and Robert C. Tischio, Great Notch, N.J., assignors to Le Salon Bruno Demetrio Ltd., New York, N.Y.

Filed May 23, 1974, Ser. No. 472,662
Int. Cl.² H05B *1/00;* **A45D** *1/04*
U.S. Cl. 219—225 **15 Claims**



1. In a hand-held hair styling iron including electrical power supply means,

a handle,
a tip detachable from said handle and
having a heating element therein heated by the electrical power supply means, and
means pivotally mounted to said handle for holding strands of the hair against the heated tip, the improvement comprising
the tip being a hollow metal housing elongated about its longitudinal axis and formed with at least one flat side surface portion coextensive with the length of said tip,
the one said flat side surface portion being disposed under the holding means which is adapted for sandwiching strands of hair therebetween, the other of the side surface portions of the housing being formed integral with the one flat side surface portion and being joined therewith at side edges,
the interior angles formed therebetween not exceeding substantially right angles, the side edges of the one flat side surface portion being slightly rounded whereby when wetted strands of hair are held over at least one of said side edges of the heated tip under slight tension, the hairs are dried and a temporary angular bend is imparted to the dried strands of hair,
said handle having means at one end to detachably receive and support said tip and electrically connect the heating element associated with the detachable tip to the electrical power supply means, said means to detachably receive and support and electrically connect including release means pivotally mounted on said handle, releasable lock means associated with said detachable tip and handle for holding said tip securely to said handle such that said electrical connection is made, said release means cooperable with the lock means to engage and disengage the same upon pivotal operation thereof by the operator using the same hand in which the handle is held.

3,955,065

HAND HELD ELECTRIC HAIR-DRYER

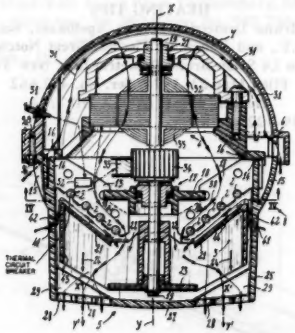
Rene Chambon, Odos, France, assignor to S E B S.A., Selongey, France

Filed Sept. 9, 1974, Ser. No. 503,937

Claims priority, application France, Sept. 11, 1973, 73.32631

Int. Cl.² H05B 1/00; F24H 3/04; A45D 20/10

U.S. Cl. 219—371 **7 Claims**



1. A hand-operated electric hair dryer comprising a casing which contains a resistance-type heating element associated with an impeller driven by an electric motor, and an air-ejection nozzle directed radially outwardly with respect to said casing, said casing comprising a first substantially hemispherical cap joined to a second substantially hemispherical cap which carries the ejection nozzle, both joined caps of the casing thus forming a substantially spherical body, at least one air-admission opening between joined edges of said caps, and a projecting beading on the edge of one of said caps arranged substantially around said spherical body and protecting said opening, said impeller being arranged for air to be drawn first into the casing through the air-admission opening, then to pass in heating contact with the heating element, and finally to pass through the impeller to be discharged from the casing through the nozzle, and the dimensions of both caps and of said projecting beading being such as to permit an easy holding of said first hemispherical cap against the palm of the hand with the projecting beading being grasped by the ends of the outspread fingers of said hand, said heating element and said air ejection nozzle having a common axis substantially coincident with the axis of revolution of the impeller, said heating element being secured within the casing by means of radial supports disposed radially with respect to said axis of revolution, each of said radial supports being fixed at one end within recesses of the cap which carries the ejection nozzle.

3,955,066

TEMPERATURE REGULATION OF HEATING CYLINDER

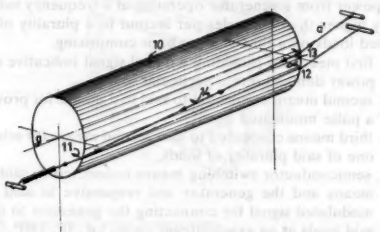
Pierre Tanguy, Daix, France, assignor to Etud S.A., Dijon, France

Filed June 7, 1974, Ser. No. 477,291

Claims priority, application France, June 13, 1973, 73.21444; May 6, 1974, 74.15503

Int. Cl.² H05B 1/02

U.S. Cl. 219—471 **18 Claims**



1. In a cooking appliance of the kind including a heating cylinder bearing a cooking surface the temperature of which is controlled by a thermostatic regulating device, the improvement that the thermostatic regulating device comprises a metal wire applied under longitudinal tension along a spiral path with a large helix angle to the surface of the aforementioned cylinder, one end of the wire being fixed to a regulating screw and its other end to the short arm of an amplification lever whose long arm is acted upon by the spring, each end of the wire being situated on the axis of a vent fixed to a side plate, a first vent being used to support the adjusting screw, whilst the second vent accommodates a blade about which the lever oscillates, the heating cylinder being mounted on an axis of rotation between the two side plates, and the end of the long arm of the lever acts on a microswitch through a micrometer adjusting screw.

3,955,067

FAT FRYING TIMING SYSTEM

Brice Eldridge, Reston, Va., assignor to Steak n Shake, Inc., Indianapolis, Ind.

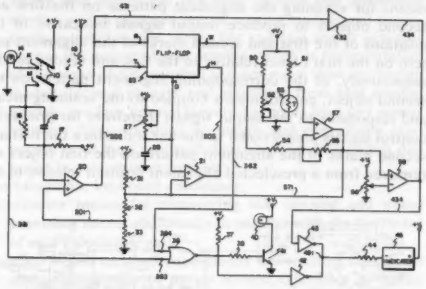
Filed Mar. 5, 1975, Ser. No. 555,401

Int. Cl.² H05B 1/02

U.S. Cl. 219—497 **7 Claims**

1. A fat frying cycle timing system, comprising:
charging means for producing a charging signal representative of elapsed time from the beginning of said cycle;
temperature sensing means adapted for sensing the temperature of said fat;

means coupled to said temperature sensing means for producing a signal representative of the temperature sensed thereby; and



electronic circuit means coupled to said means for producing a signal representative of temperature and to said charging means for producing a signal indicative of completion of said timing cycle and for varying the length of said timing cycle in response to said signal representative of said fat temperature.

3,955,068

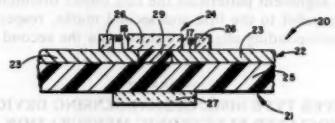
FLEXIBLE CONDUCTOR-RESISTOR COMPOSITE

Joseph M. Shaheen, La Habra, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 27, 1974, Ser. No. 509,883

Int. Cl.² H05B *3/16*

U.S. Cl. 219—549 **8 Claims**



1. A conductor-resistor composite comprising:

a base of a first flexible insulative material, said base having a first region and a second region;

at least one resistor element, said resistor element having an intermediate portion disposed above said second ragion of said base, said resistor element further having first and second ends disposed above said first region of said base;

a plurality of conductors supported on said first region of said base, at least two of said conductors being interposed between said base and said first and second ends, respectively, of said resistor element and in electrical contact with said first and second ends, respectively, of said resistor element;

at least one insulative support member of a second flexible insulative material projecting from said second region of said base interposed between said intermediate portion of said resistor element and said base for supporting said resistor element intermediate said first and second ends thereof.

3,955,069

PRESETTABLE COUNTER

Richard T. Ziemba, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Division of Ser. No. 292,966, Sept. 28, 1973, Pat. No. 3,844,217. This application Nov. 29, 1973, Ser. No. 420,358

Int. Cl.² G06M *3/02*; H03K *21/36*

U.S. Cl. 235—92 PE **3 Claims**

1. A presettable counter, including:

counter means; and

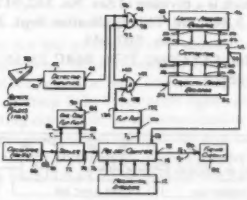
presetting means including

an outer element, journaled for rotation, and having an inner surface;

an inner element journaled for rotation, having an outer surface bearing a first plurality of parallel, spaced apart, electrically insulated, elongated conductors resiliently bearing against said inner surface of said outer element;

a dielectric tape, disposed between and engaged by said inner surface of said outer element and said first plurality of conductors, and translatable by concurrent rotation of said outer and inner elements;

said tape having a second plurality of spaced apart, electrically insulated, elongated conductors upon that surface of said tape which faces said inner element, so that, as a function of such FILE NAME- FILEC04/01/76JOB NAME- 04C4573 TERMINAL STATUS- ENTRY BATCH - 00005 OPERATOR CODE- 535100MODE- ENTRY RCD - translation, different ones of said second plurality of conductors electrically interconnect different ones of said first plurality of conductors;



an additional element having a third plurality of spaced apart, electrical insulated, conductors, equal in number to said first plurality, each of said third plurality of conductors respectively engaged with a conductor of said first plurality of conductors; and

a fourth plurality of conductors for electrically connecting said third plurality of conductors to said counter means.

3,955,070

APPARATUS FOR MEASURING VARIABLE QUANTITIES

Keisuke Suzuki; Toru Fukumura, both of Hiratsuka, and Okinori Moriya, Yokohama, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

Filed May 1, 1974, Ser. No. 465,983

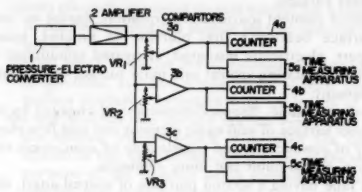
Claims priority, application Japan, May 7, 1973, 48-53399[U]

Int. Cl.² G04F *10/00*; G01L *23/00*

U.S. Cl. 235—92 MT **7 Claims**

1. Apparatus for monitoring surges in a variable quantity such as fluid pressure, stress or strain, comprising a plurality of pulse generator means each responding to said quantity exceeding a preset value therefor by generating an electric pulse having a predetermined level during the interval in which said quantity exceeds said preset value, the preset values to which the different pulse generator means respond being different from one another, a plurality of counters each

counting the number of said pulses generated by a corresponding pulse generator means, and a plurality of time measuring apparatus each cumulatively adding the durations of said pulses generated by a corresponding pulse generator means.



3,955,071

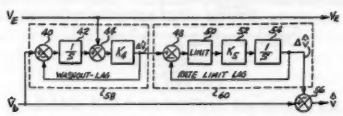
WINDSHEAR DETECTION SYSTEM

Antonius A. Lambregts, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 416,540, Nov. 16, 1973, Pat. No. 3,892,374, which is a division of Ser. No. 342,917, March 19, 1973, Pat. No. 3,840,200. This application Sept. 20, 1974, Ser. No. 507,641

Int. Cl.[2] G06G *7/78;* **B64C** *13/16*

U.S. Cl. 235—150.2 **4 Claims**



1. An aircraft instrument comprising first means for providing a first signal representative of the airspeed deviation of an aircraft from a preselected command speed;

second means for providing a second signal representative of the inertial longitudinal acceleration of the aircraft;

third means for processing said first and second signals, said third means including washout and lag circuit means for providing an output signal representative of the difference between the lagged inertial longitudinal acceleration and the lagged rate of change of airspeed deviation; and

fourth means connected to the output of said third means, said fourth means comprising a rate limited lag circuit for providing at the output thereof the low frequency signal component of said output signal of said third means, said low frequency signal component indicative of a windshear condition.

3,955,072

APPARATUS FOR THE AUTOMATIC ALIGNMENT OF TWO SUPERIMPOSED OBJECTS FOR EXAMPLE A SEMICONDUCTOR WAFER AND A TRANSPARENT MASK

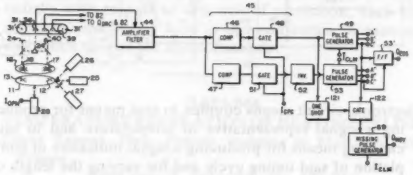
Karl-Heinz Johannsmeier, Los Altos; Paul E. Stoft, Menlo Park, and Tor G. Larsen, Saratoga, all of Calif., assignors to Kasper Instruments, Inc., Mountain View, Calif.

Continuation of Ser. No. 126,597, March 22, 1971, abandoned. This application June 12, 1972, Ser. No. 305,861

Int. Cl.[2] G06F *15/46;* **H05K** *13/00*

U.S. Cl. 235—151.11 **40 Claims**

17. A system for aligning first and second relatively movable objects, where the first object has an alignment pattern thereon comprising first and second marks oriented at an angle relative to one another and the second object has a corresponding alignment pattern thereon comprising first and second marks oriented at substantially the same angle relative to one another as the first and second marks of the alignment pattern on the first object, said system comprising scanning means for scanning the alignment patterns on the first and second objects to produce output signals indicative of the positions of the first and second marks of the alignment pattern on the first object relative to the first and second marks, respectively, of the corresponding alignment pattern on the second object, control means coupled to the scanning means and responsive to the output signals therefrom for producing control signals proportional to the linear distance the first and second marks of the alignment pattern on the first object are removed from a preselected alignment position relative to the



first and second marks, respectively, of the corresponding alignment pattern on the second object to control the relative movement between the first and second objects, and drive means coupled to the control means and responsive to the control signals therefrom for producing relative movement between the first and second objects to bring the first and second marks of the alignment pattern on the first object into the preselected alignment position relative to the first and second marks, respectively, of the corresponding alignment pattern on the second object with the first and second marks of the alignment pattern on the first object oriented substantially parallel to the first and second marks, respectively, of the corresponding alignment pattern on the second object.

3,955,073

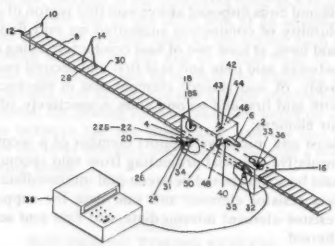
CALIPER TYPE DIMENSIONAL SENSING DEVICES AND ASSOCIATED ELECTRONIC MENSURATION, DATA PROCESSING AND PRINTOUT SYSTEM

Victor E. Carew, and Victor E. Carew, Jr, both of 610 W. Taylor Run Parkway, Alexandria, Va. 22314

Filed May 14, 1974, Ser. No. 469,770

Int. Cl.[2] G01B *7/00*

U.S. Cl. 235—151.32 **27 Claims**



1. A device for conveniently determining and displaying the dimensions, girth, surface areas, and volume of a regularly shaped object by mensuration of a second dimension and the application of a mathematical function to the sensed dimension and a subsequently sensed dimension comprising:

means for sensing dimension of an object and for providing an electrical signal representative thereof, said means for sensing a dimension consisting of at least one sensor bar having at least one sensor actuator disposed along its length and a jaw face normal to said sensor bar at one

end, a sensing module having a slide tunnel for slidably receiving said sensor bar and a jaw face parallel to and facing said sensor bar jaw face, at least one dimension sensing switch disposed in said sensing module and operatively coupled to said sensor bar and said sensor actuator so that the action of said sensing switch is representative of the measured dimension and not more than one spring loaded decimal plunger rod extending from said sensing module jaw face normal thereto having at least one sensor actuator disposed along its length and operatively connected to at least one said dimension sensing switch disposed in said sensing module;

an electronic keyboard calculator;

conductor means for connecting said sensing and signal providing means electrically in parallel with the keyboard of said calculator; and,

control switch means for selectively transmitting said signal along said conductor means to said calculator, whereby said dimension is registered in said calculator.

3,955,074

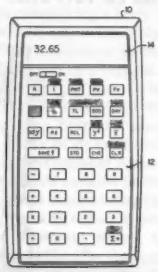
GENERAL PURPOSE CALCULATOR HAVING KEYS WITH MORE THAN ONE FUNCTION ASSIGNED THERETO

France Rode, Los Altos; William L. Crowley, Jr., Cupertino, and Alexander D. R. Walker, San Francisco, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 302,371, Oct. 30, 1972, Pat. No. 3,863,060. This application Oct. 10, 1974, Ser. No. 513,801

Int. Cl.² G06F *3/02*

U.S. Cl. 235—156 **15 Claims**



1. An electronic calculator comprising:

keyboard input means for entering information into the calculator;

storage means, coupled to said keyboard input means, for storing information entered into the calculator;

processing means, coupled to said keyboard input means and said storage means, for processing information entered into the calculator and stored in said storage means to perform selected calculations; and

output means, coupled to said processing means, for displaying the results of selected calculations performed by said processing means;

said keyboard input means including a plurality of input keys manually operable for causing said processing means to perform a first plurality of operations designated by a first plurality of legends positioned on said keyboard input means and associated with said plurality of input keys;

said keyboard input means further including a command key manually operable with said plurality of input keys for conditioning said processing means to perform any one of a second plurality of operations designated by one of a second plurality of legends positioned on said keyboard input means and associated with said plurality of input keys;

said command key and said second plurality of legends being coded to associate said command key with each of said second plurality of operations designated by said second plurality of legends.

3,955,075

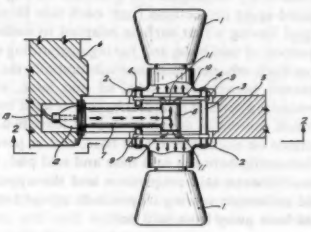
DOORKNOB ILLUMINATING DEVICE

Joseph Susedik, 3107 W. Tyler, Anaheim, Calif. 92801

Filed Oct. 15, 1974, Ser. No. 514,468

Int. Cl.² F21V *33/00*; **E05B** *17/10*

U.S. Cl. 240—2.13 **4 Claims**



1. A device for the providing of a decorative illuminated doorknob comprising, in combination, a door, a light source outside such door, a plastic light transmitting rod within such door for transmitting light from such light source, a plastic light transmitting doorknob, in communication with such rod and light source and means for transmitting such light from such light source to such doorknob whereby the light received by such rod is transmitted to such doorknob from inside such door.

3,955,076

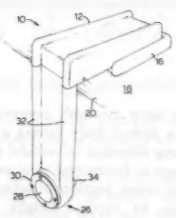
UNDERWATER SWIMMING POOL ILLUMINATION SYSTEMS

Frank D. Shaw, 185 Markland Drive, Etobicoke, Ontario, Canada (M9C 1P2)

Filed June 6, 1974, Ser. No. 477,003

Int. Cl.² F21V *31/00*

U.S. Cl. 240—26 **9 Claims**



1. For use in underwater swimming pool illumination, an underwater lighting assembly comprising:

a waterproof lamp enclosure formed in the lower portion of a strut which is associated with a base in a generally L-shaped assembly; where said strut is adapted to be lowered into a swimming pool over the edge thereof, and said base is adapted to be secured to the swimming pool deck;

said waterproof lamp enclosure having a generally bowl-shaped body portion adapted to receive the rear portion of a conically-shaped lamp unit, an O-ring seat formed around the outer part of said body portion and a compressible O-ring fitted in said O-ring seat, retainer means to fit over the outer part of said lamp unit, a flange

formed around the outer part of said bowl-shaped body portion, and fastener means associated with said flange and said retainer means to cause the rear portion of said lamp unit to be forced against said compressible O-ring when said fastener means are tightened;

electrical wires attached to said lamp unit and passing rearwardly from said body portion, and contained within said strut;

and a low voltage battery connected to said electrical wires to provide low voltage, ripple-free direct current power to said lamp unit;

said base being adapted to be fitted to a pad and being substantially rectangular in plan and having at least two spaced-apart projections from each side thereof;

said pad having a first surface adapted to underlie at least a portion of said base, and having upstanding sides spaced from each other at a distance substantially the same as the distance between the sides of said base; each of said upstanding sides of said pad having at least two undercuts formed therein to accommodate at least two of said projections on each side of said base, and to permit a sliding relationship between said base and said pad, the interference between said projections and the upper portion of said undercuts serving to preclude upward movement of said base away from said pad.

3,955,077
LAMP REFLECTORS AND MOTOR VEHICLE LAMP ASSEMBLIES INCORPORATING SAME

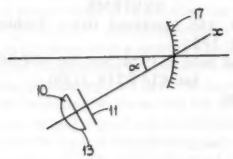
Kenneth James Jones, Sutton Coldfield, and Robert Arthur Hargroves, Solihull, both of England, assignors to The Lucas Electrical Company Limited, Birmingham, England

Filed Sept. 27, 1974, Ser. No. 509,963

Claims priority, application United Kingdom, Sept. 29, 1973, 45656/73

Int. Cl.² F21V *13/04*

U.S. Cl. 240—41.3 **14 Claims**



1. A motor vehicle lamp assembly comprising (1) a lamp reflector comprising a dished body having a reflective inner surface, said body being elliptical in vertical axial section and having a different shape in horizontal axial section, said body also having a vertical cross section in which its horizontal width is greater than its vertical height, (2) a filament mounted in said lamp reflector, and (3) a further reflector arranged to receive light from said element, said further reflector having a reflective surface lying on a paraboloid of revolution and a focal point which lies at an outer focal point of said elliptical vertical section of said reflector body.

3,955,078
MULTI-PURPOSE FISHING LIGHT

Larry A. Eggers, and Walter A. Eggers, both of 742 Westview St., Springfield, Mo. 65804

Filed Sept. 6, 1974, Ser. No. 503,774

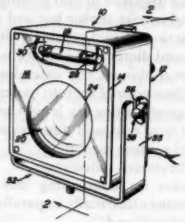
Int. Cl.² F21V *21/00*

U.S. Cl. 240—52 R **13 Claims**

1. A multi-purpose fishing light comprising, in combination:

a. a box-like housing having a rectangular opening therein;

b. a rectangular, translucent lens covering the opening of the housing, the lens having an aperture offset from the center of the lens;



c. an elongate first lamp for shining light through the lens disposed in the housing offset from the center of the lens in a direction away from the aperture;

d. a second lamp disposed in the aperture in the lens; and

e. regulator means for controlling the operation of the first and second lamps.

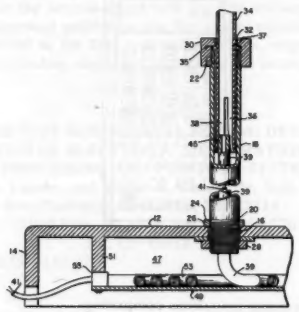
3,955,079
MULTIPLE POSITION LAMP

Earle F. Chapman, Summer St., Marshfield Hills, Mass. 02050, and Bernard J. Ruskin, 17 Sheldon Road, Marblehead, Mass. 01945

Filed Jan. 22, 1974, Ser. No. 435,451

Int. Cl.² F21V *21/22*

U.S. Cl. 240—70 **7 Claims**



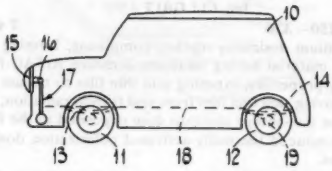
1. A lamp comprising a base having a horizontal base portion and a depending skirt portion, a plate mounted in said base under said horizontal base portion and defining a base chamber therewith, said horizontal base portion having an opening therethrough, a lower rigid tube affixed to said base portion and communicating with said opening, an upper rigid tube slidable frictionally and telescopically in said lower rigid tube, a lamp socket connected to the upper end of said upper rigid tube, a semi-rigid spring-like tube having an upper linear portion connected fixedly to said upper rigid tube and extending downwardly through said lower rigid tube into said base chamber, said semi-rigid springlike tube having a lower coiled portion in said base chamber, an electrical cord having one end electrically and mechanically connected with said socket, extending through said semi-rigid spring-like tube and extending outwardly from within said base chamber, an electrical plug being electrically connected to the other end of said electrical cord, selected increments of said semi-rigid spring-like tube being part of said lower coiled portion when said upper rigid tube is retracted to a first position toward said base and being part of said upper linear portion when said upper rigid tube is extended to a second position away from said

base, said semi-rigid spring-like tube having a predetermined elastic limit, said selected increments at no time exceeding said predetermined elastic limit, whereby when said upper tube is telescopically extended a lesser portion of said electrical cord is stored in said coil and when said upper tube is telescopically retracted a greater portion of said electrical cord is stored in said coil.

3,955,080
MOTOR VEHICLE WITH HEADLAMP TILTING MECHANISM

Frederick Raymond Patrick Martin, Kent, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed Mar. 21, 1975, Ser. No. 561,006
Claims priority, application United Kingdom, Mar. 30, 1974, 14220/74
Int. Cl.² B60Q 1/10
U.S. Cl. 240—7.1 LJ **5 Claims**



1. A motor vehicle comprising a body, a pair of headlamps, a rod mounted for movement on the body and connected with the headlamps so that movement of the rod effects tilting movement of the headlamps in a vertical plane, and a mechanism for effecting movement of said rod in response to change in the attitude of the body relative to wheels of the vehicle, said mechanism including first and second resilient means, each being secured at one of its ends with respect to the rod, an opposite end of the first resilient means being engaged with an abutment member fixed relative to the body, an opposite end of the second resilient means being biassed by the remainder of the mechanism in a direction in which the first resilient means engaging the abutment means is stressed, whereby changes in the biassing applied by the remainder of the mechanism to the second resilient means are partially absorbed by balancing of the stresses in the first and second resilient means so that a reduced signal is transmitted to the rod by the mechanism.

3,955,081
EXPOSURE CONTROL CIRCUIT

Takayoshi Sato, Tokyo, and Kunio Ando, Warabi, both of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Apr. 2, 1974, Ser. No. 457,171
Claims priority, application Japan, Apr. 4, 1973, 48-38579
Int. Cl.² H01J 39/12
U.S. Cl. 250—210 **2 Claims**

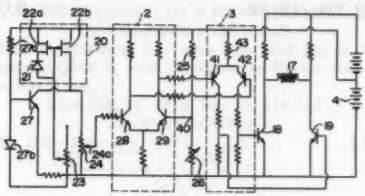
1. An exposure control circuit including a bridge circuit having four arms connected with a power supply and with an amplifier to amplify the imbalance output thereof and transmit the amplified output to a means to operate an exposure control element in accordance with several kinds of exposure input information put in the circuit comprising in combination;

a photovoltaic type photodetector for input of first exposure information provided in the first arm of said bridge circuit to receive light from the object to be photographed, said photodetector being connected between the source and the gate of a first field effect transistor to protect the photodetector from a high voltage,

a transistor connected with said photodetector to amplify the photocurrent thereof,

a first resistor for input of second exposure information connected with said photodetector to convert the current flowing through the photodetector to a corresponding voltage, said first resistor and said photodetector being connected in series with the power supply,

a second resistor for input of third exposure information provided in the second arm of the bridge circuit and



connected with said transistor to convert the current taken out by the transistor to a corresponding voltage, said first and said second resistors being connected in parallel with the power supply,

a third resistor for input of fourth exposure information provided in the third arm of the bridge circuit, and

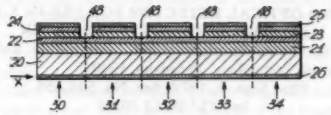
a fourth resistor for input of fifth exposure information provided in the fourth arm of the bridge circuit,

whereby five kinds of exposure information are independently put into the bridge circuit.

3,955,082
PHOTODIODE DETECTOR WITH SELECTIVE FREQUENCY RESPONSE

John Cameron Dyment, Kanata, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Sept. 19, 1974, Ser. No. 507,455
Int. Cl.² H01J 39/12
U.S. Cl. 250—211 J **5 Claims**



1. A photodiode detector, comprising:

a substrate;

a multilayer structure on a surface of said substrate, said structure comprising a plurality of aligned detector sections;

said structure comprising a confining layer on said surface of said substrate and an active layer on said confining layer, said confining layer and said active layer of the same conductivity type and extending homogeneously across said substrate for all the detector sections;

said active laye providing a waveguide layer having a portion for each detector with said portions in optical alignment, the active layer having an input end;

a further confining layer on said active layer, said further confining layer of a conductivity type opposite to that of said active layer and separated into portions, a portion for each detector section, the portions of said further confining layer electrically isolated from each other;

means for applying a reverse bias to each detector section, the bias successively more negative for each successive section from said input end;

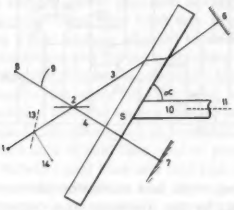
output means for each section for producing an output signal indicative of photon absorption in said section.

3,955,083

INTERFEROMETRIC DEVICE FOR ENCODING SHAFT ANGLES

Christian James Collins, Letchworth, and Gilbert Frank Stanley, St. Albans, both of England, assignors to Hawker Siddeley Dynamics Limited, England

Filed Nov. 25, 1974, Ser. No. 527,170
Claims priority, application United Kingdom, Nov. 27, 1973, 54872/73; Mar. 4, 1974, 09615/74; Mar. 7, 1974, 10205/74
Int. Cl.² G01D 5/34
U.S. Cl. 250—231 SE 9 Claims



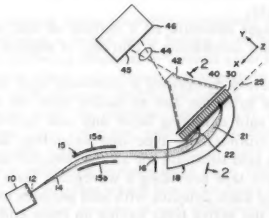
1. Apparatus for measuring shaft angle, comprising a source of monochromatic light, a beam splitter splitting the beam from said source into transmitted and reflected beams, an angular-displacement-responsive optical assembly through which the transmitted and reflected beams pass along separate paths, means for bringing the transmitted and reflected beams together after their passage along said separate paths to form a recombined beam, and detector means toward which the recombined beam is directed and which detects interference fringes in the recombined beam, said angular-displacement-responsive optical assembly including at least one optical component that is arranged to be displaced angularly relatively to the remainder of the system by amounts representative of the angle to be measured and thereby differently varying the respective lengths of said separate paths.

3,955,084

ELECTRO-OPTICAL DETECTOR FOR USE IN A WIDE MASS RANGE MASS SPECTROMETER

Charles E. Giffin, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Sept. 9, 1974, Ser. No. 504,455
Int. Cl.² H01J 39/34
U.S. Cl. 250—281 38 Claims



1. An electro-optical detector for use with a mass spectrometer of the type focusing ion beams at a focal plane at substantially the exit end of a magnetic analyzer at which a magnetic field is present, the detector comprising:

a microchannel electron multiplier array, defining a plurality of parallel hollow channels each with an inlet end and an outlet end, all of said inlet ends being in a first plane defining a front end of said array and the outlet ends being in a second plane defining a back end of said array, said array being located at said focal plane so that the front end faces said magnetic analyzer and at least said back end is at an angle with respect to said focal plane, whereby ions in said ion beams enter channels in said array through the inlet ends thereof, producing secondary electrons therein, said secondary electrons exiting said channels through said back end forming electron beams; and

circuit means including electron-sensitive means spaced apart from the array back end and parallel thereto for intercepting each of said electron beams to form an image thereon and means for processing the images formed on said electron-sensitive means.

3,955,085

THIN FILM TRITIUM DOSIMETRY

Paul R. Moran, Madison, Wis., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 23, 1975, Ser. No. 598,275
Int. Cl.² G01T 1/00
U.S. Cl. 250—336 7 Claims

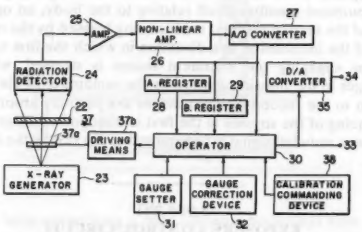
1. A tritium dosimetry method comprising: forming a thin film of a material having relatively sensitive RITAC-RITAP dosimetry properties; exposing said thin film to tritium radiation; removing said thin film from said tritium radiation; determining the low-energy electron dose deposited in the film by radiation-induced thermally-activated polarization dosimetry techniques.

3,955,086

RADIATION THICKNESS GAUGE

Tatsuo Tsujii, Tokyo, and Fumio Nishiwaki, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 6, 1975, Ser. No. 574,875
Claims priority, application Japan, May 13, 1974, 49-52324
Int. Cl.² G01N 23/00
U.S. Cl. 250—358 R 9 Claims



1. In a thickness gauge of the type wherein the thickness of a sample to be measured interposed between a source of radiations and a radiation detector is measured by detecting the amount of the radiations which have been transmitted through said sample and attenuated functionally in accordance with the radiation absorption characteristic and the thickness of said sample, the improvement which comprises means for transmitting a radiation flux through a reference sheet utilized for calibration purposes and having a thickness manifesting a radiation absorption which is equivalent to that of the sample having a nominal thickness which has been compensated for the difference in the radiation absorption characteristics of said reference sheet and said sample, means for detecting the amount of the radiations transmitting through said reference sheet and said sample, memory means for storing the output of said detecting means when said reference sheet is irradiated with the radiation flux, and operator means in which the output of said detecting means when said

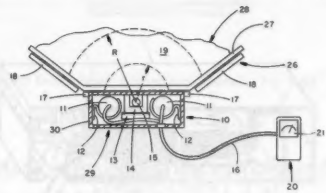
sample is irradiated with the radiation flux is substituted for a term of an equation representing the variation in the thickness determined by the content of said memory means and the radiation absorption function of said reference sheet so as to produce an output signal representing the thickness of said sample.

3,955,087

APPARATUS FOR MEASURING MOISTURE IN MOVING BULK MATERIAL USING A LITHIUM-7 RADIATION SOURCE

John B. Ashe, Palatine, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Sept. 4, 1974, Ser. No. 503,487
Int. Cl.² G01N 23/12
U.S. Cl. 250—360 18 Claims



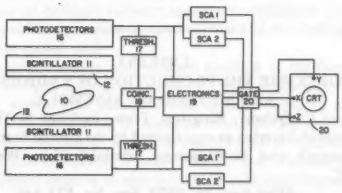
1. A neutron-reflection gauge for determining moisture content in moving bulk material comprising a neutron emitting means for stationary positioning proximate to said moving bulk material to produce neutron radiation having a mean energy less than three million electron volts and a maximum neutron energy of less than five million electron volts, said means thereby causing the emission of thermal neutrons by said bulk material, a thermal neutron detector located in a fixed position adjacent to said moving bulk material and said stationary neutron emitting means for detecting neutrons thermalized by said bulk material and impinging directly upon said detector, radiation shielding for isolating said neutron emitting means from said thermal neutron detector, and indicator means connected to said detector to display a signal indicative of moisture content of the aforesaid bulk material.

3,955,088

POSITRON IMAGING DEVICE WITH PLURAL COINCIDENCE CHANNELS AND GRADED RADIATION ABSORPTION

Gerd Muehllehner, Mount Prospect, and Ronald J. Jaszczak, Arlington Heights, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Oct. 2, 1974, Ser. No. 511,285
Int. Cl.² G01T 1/20
U.S. Cl. 250—363 S 7 Claims



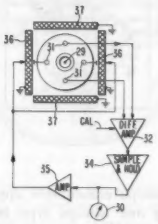
1. In a positron imaging scintillation camera for detecting the radioactive distribution of positron events within an organ of interest of a living subject utilizing dual scintillation detectors positioned on opposite sides of said organ of interest and registration means for recording positron events, the improvement comprising continuous, uniform graded absorption shielding means positioned between each of said detectors and the aforesaid organ of interest, discrimination means defining at least two separate acceptable ranges of radioactive energy, and coincidence gating means connected to said dual detectors for permitting the registration of only those radioactive events which are detected in coincidence by said dual detectors.

3,955,089

AUTOMATIC STEERING OF A HIGH VELOCITY BEAM OF CHARGED PARTICLES

Raymond D. McIntyre, Los Altos Hills, and Jay D. Wood, Cupertino, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Oct. 21, 1974, Ser. No. 516,703
Int. Cl.² G01K 1/08
U.S. Cl. 250—399 1 Claim



1. In a radiation generating machine:

means for producing and accelerating a beam of charged particles;

an X-ray target positioned in the path of said beam to generate X-rays for irradiation of a subject;

means for supporting said particle beam producing and accelerating means and for moving said beam producing and accelerating means around a subject to be irradiated and thereby changing the position of said beam producing and accelerating means relative to the direction of a force field of the earth;

means for steering the accelerated beam over a certain predetermined beam path relative to said accelerating means;

secondary emission forming means disposed around the predetermined beam path upstream of the beam relative to said X-ray target for generating a field of ionizing radiation outwardly of the beam when the beam impinges upon said secondary radiation forming means;

ionization chamber detector means disposed around the predetermined beam path for detecting the intensity of the ionizing radiation field generated by said secondary emission forming means, said ionization chamber detector means including chamber means filled with an ionizable medium, and electrode means operatively associated with said chamber means for detecting the ionization current signal flowing within said chamber means as a function of position around said beam due to ionization of the medium fill therein caused by ionizing radiation incident thereon;

means for comparing the detected ionization current signals as a function of position of the beam and for deriving an error signal determinative of the deviation of the beam, if any, from the intended beam path;

said beam steering means being responsive to said error signal for steering the beam along a predetermined beam path; and

sample and hold means for sampling and holding the error signal to which the beam steering means is responsive, whereby upon initiation of the beam after interruption of the beam the beam steering means is responsive to the

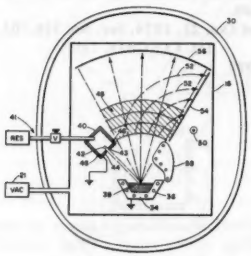
same error signal upon initiation of the beam as it was at the time the beam was interrupted.

3,955,090

SPUTTERED PARTICLE FLOW SOURCE FOR ISOTOPICALLY SELECTIVE IONIZATION

Eugene R. Astley, and Harold K. Forsen, both of Bellevue, Wash., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.

Filed Dec. 27, 1973, Ser. No. 428,662
Int. Cl.[2] H01J 39/34
U.S. Cl. 250—423 46 Claims



1. For use in isotope enrichment apparatus, a system for selectively ionizing one isotope type in an environment of plural isotope types comprising:

a reservoir of a material having plural isotope types;

means for sputtering neutral particles of said plural isotope types from said reservoir in at least gram quantities by directing a beam of particles at said material thereby to define said environment;

means for selectively ionizing particles of at least one isotope type in said environment; said ionizing means including means for selectively photoexciting said particles of the at least one isotope type; and

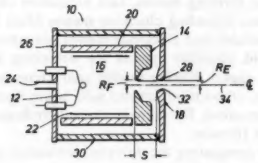
means for separately collecting the selectively ionized particles.

3,955,091

METHOD AND APPARATUS FOR EXTRACTING WELL-FORMED, HIGH CURRENT ION BEAMS FROM A PLASMA SOURCE

William P. Robinson, Austin, Tex., and Robert L. Seliger, Agoura, Calif., assignors to Accelerators, Inc., Austin, Tex.

Filed Nov. 11, 1974, Ser. No. 522,796
Int. Cl.[2] H01J 7/24, 37/08
U.S. Cl. 250—423 8 Claims



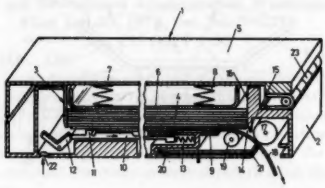
1. Apparatus for generating a well-formed, high current ion beam from an ion plasma, comprising in combination a focus electrode defining an ion source aperture, an ion plasma generator disposed proximate the ion source aperture for generating an ion plasma, and an extraction electrode defining an ion exit aperture, the ion exit aperture being axially aligned with the ion source aperture and spaced therefrom a distance at least five times the radius of the ion exit aperture to define ion extraction optics having an electron perveance P_{e^-} of not greater than $5 \times 10^{-8} AV^{-3/2}$ wherein A is the unit current in amperes and V is the applied extraction voltage in volts.

3,955,092

ARRANGEMENT FOR RESPECTIVELY WITHDRAWING A SINGLE FILM SHEET FROM A STACK OF DIRECTLY LOOSELY SUPERIMPOSED FILM SHEETS

Gunter Hubert, Baiersdorf, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Oct. 9, 1974, Ser. No. 513,494
Claims priority, application Germany, Oct. 13, 1973, 2351541
Int. Cl.[2] G03B 41/16
U.S. Cl. 250—468 5 Claims



1. In an arrangement for respectively withdrawing a single film sheet from a stack of directly loosely superimposed film sheets, particularly for use in X-ray filming apparatus, including a magazine having said stack of film disposed therein; and transport means for conveying the lowermost film sheet of said stack positioned on the floor of said magazine through a withdrawal slot in said magazine, the improvement comprising: said withdrawal slot being formed in the floor of said magazine extending along a side wall of the latter and having a width of approximately 3 mm; means for separating the lowermost film sheet from the superposed film sheet including a portion of said side wall of said magazine in the vertical elevation of the film sheet positioned on the floor of said magazine being sloped at an angle in the range of 10° to 25° with respect to a perpendicular to the floor of said magazine away from the direction of said film stack; a first rotatable roll extending along the edge of the withdrawal slot associated with the floor of said magazine; and means for preventing rubbing of a film sheet along the edge of the withdrawal slot during withdrawal including a second rotatable roll located in the sheet withdrawing direction in close proximity to said withdrawal slot in parallel spaced relationship with said first rotatable roll at the other side of said sloped side wall, said film sheet adapted to be conveyed between said rotatable rolls.

3,955,093

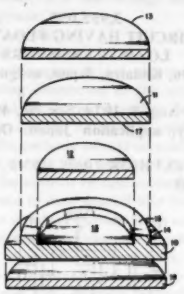
TARGETS FOR THE PRODUCTION OF RADIOISOTOPES AND METHOD OF ASSEMBLY

Thomas C. Quinby, Kingston, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,446
Int. Cl.[2] G21G 4/00
U.S. Cl. 250—493 6 Claims

1. A method of assembling targets for the production of radioisotopes by the nuclear reaction of a metallic sample with incident particles, said method comprising enclosing said metallic sample within a metallic support structure and bonding said sample to the interior surface of said support structure

by intermetallic diffusion bonding, said support structure having sufficient thermal conductivity to prevent melting of



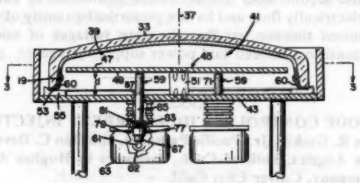
said sample from heat dissipated therein by said incident particles.

3,955,094

RADIANT ENERGY EMITTER FOR COLOR CRT FABRICATION

J. Robert Barczynski, Waterloo, and Jerry F. Janssen, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 13, 1975, Ser. No. 557,877
Int. Cl.² B01K *1/00*
U.S. Cl. 250—527 **6 Claims**



1. In an apparatus for photo-exposing the perimetrical sidewall portion of a color cathode ray tube glass face panel having negative radiant energy sensitive coating interiorly dis- ed thereon, and wherein an areal shielding member is spatially supported above a base member in a manner to be positioned within said panel to shield the viewing area thereof, radiant energy emission means oriented to radiant exposure energy in a manner substantially directionally parallel to the bottom of said shielding means, said emission means comprising:

a source of brilliant radiant energy encompassed within a compatible enclosure located outward of the sealing edge of said panel; and

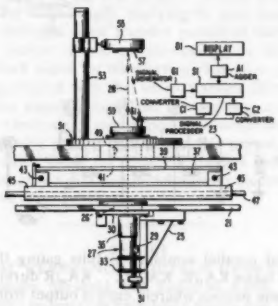
a transparent energy transmission medium in the form of a substantially cylindrical collector rod positioned to extend within said panel normal to said shielding means, said collector having an input portion with a proximal end surface associated with said energy source and an outward portion having a distal end surface oriented within said panel relative to the bottom of said shielding means, said output portion comprising a longitudinal section of said collector rod having a length not exceeding the distance between said base and said shielding members, the cylindrical surface of said output portion being abraded to provide a radiation emissive surface to direct exposure energy substantially radially outward toward said panel sidewall.

3,955,095

METHOD AND APPARATUS FOR DETERMINING THE AVERAGE SIZE OF APERTURES IN AN APERTURED MEMBER

George Simon Gadbois, and Frank Rowland Ragland, Jr., both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,228
Int. Cl.² G02B *27/38*
U.S. Cl. 250—550 **10 Claims**



1. A method for determining the average aperture width of a portion of an array of apertures in an apertured mask for a cathode ray tube, said method comprising:

a. projecting a beam of substantially monochromatic light through a plurality of apertures in said portion of said mask to thereby produce a combined light interference and diffraction pattern containing aperture width information,

b. detecting the intensities of at least two fringes of said pattern,

c. generating separate electrical signals which are representative of said detected intensities, and

d. processing said generated electrical signals in accordance with the relationship

$$\overline{b} = k + V_s R^m$$

where $\overline{b}$ represents the average aperture width, R has a value representing the ratio of said generated electrical signals and k, V_s and m have values corresponding to a given mask.

3,955,096

IMPLICIT RATIO COMPUTER FOR SEQUENTIAL SIGNALS

Mark Edwin Faulhaber, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 19, 1975, Ser. No. 588,643
Int. Cl.² G01N *21/22*; H03K *5/18*
U.S. Cl. 250—565 **6 Claims**

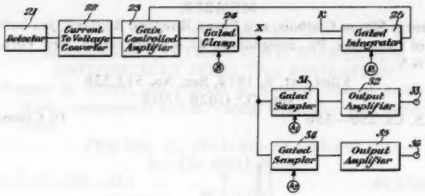
1. In an electrical signal ratioing circuit for a source delivering an electric analog signal pulse sequence comprising measured parameter signals A_1, A_2 . . . A_n, and at least one reference signal R,

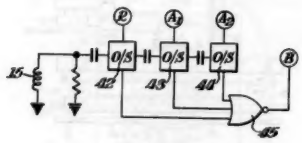
signal gating and timing means having signal identification means maintaining time coordination with said signal pulse sequence, and gate actuating means responsive to said signal identification means actuating, for predetermined time durations, the respective gates corresponding to said signals A_1, A_2 . . . A_n, and, R

an amplifier which imparts a gain G to said signals,

a gated integrator which, during the gated period wherein said reference signal R is delivered, has a first input terminal receiving the sum of said signal pulse sequence of a given polarity from said amplifier and a substantially constant d-c reference voltage K of opposite polarity, and a second input terminal connected to ground,

means supplying said integrator output to control a gain — determining resistance for said amplifier, and





individual parallel sampling circuits gating the individual signal ratios KA_1/R, KA_2/R . . . KA_n/R during the successive time periods wherein each is output from said amplifier.

3,955,097

ALTERNATOR DRIVEN BY A VEHICLE ENGINE

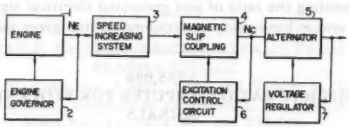
Nobuhito Hobo, Inuyama; Osamu Ito, Toyota; Yoshihiko Tsuzuki, Anjo; Yutaka Suzuki, Nishio; Itsushi Kawamoto, Kariya; Suguru Sato; Yoshihiko Huruya, both of Oobu; Kenro Sekino, and Hironari Nukata, both of Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 25, 1974, Ser. No. 518,214

Claims priority, application Japan, Nov. 29, 1973, 48-134053

Int. Cl.² F02N *11/06*

U.S. Cl. 290—40 R **13 Claims**



1. A vehicle engine-driven alternator of the type which generates an AC power supply voltage having a constant frequency, comprising:

an engine for generating a turning driving force;

an engine governor for coarsely adjusting the rotational speed of said engine to a preset speed;

a magnetic slip coupling having an input shaft connected to said engine and an output shaft, whereby the turning driving force applied from said engine to said input shaft is transmitted to said output shaft in the form of a torque corresponding to an excitation current supplied to said magnetic slip coupling;

an alternator connected to said output shaft of said magnetic slip coupling for generating an AC power supply voltage having a frequency corresponding to the number of revolutions of said output shaft; and

an excitation control circuit for detecting and comparing the number of revolutions of said output shaft with a preset value to generate an output depending on the result of said comparison, whereby said excitation current is controlled in accordance with said output to cause the number of revolutions of said output shaft to approach said preset value.

3,955,098

SWITCHING CIRCUIT HAVING FLOATING GATE MIS LOAD TRANSISTORS

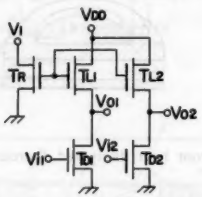
Hiroshi Kawamoto, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 8, 1974, Ser. No. 495,769

Claims priority, application Japan, Oct. 12, 1973, 48-113929

Int. Cl.² H03K *19/08, 19/40, 17/10*

U.S. Cl. 307—205 **6 Claims**



1. In a switching circuit including a first driving metal-insulator-semiconductor transistor and a first load metal-insulator-semiconductor transistor connected in series with a source of supply voltage, and a second driving metal-insulator-semiconductor transistor and a second load metal-insulator-semiconductor transistor connected in series with said source of supply voltage,

the improvement wherein the gate electrodes of said first and second load transistors are connected in common, electrically float and have a prescribed quantity of charge stored thereon, so that the gate voltages of said load transistors exceed said power supply voltage.

3,955,099

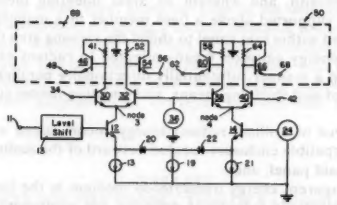
DIODE CONTROLLED IDLE CURRENT INJECTION

James R. Gaskill, Jr., Pacific Palisades, and Don C. Devendorf, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 11, 1974, Ser. No. 450,019

Int. Cl.² H03K *17/00*

U.S. Cl. 307—218 **6 Claims**



1. In an ECL network having a lower current switching circuit and a first and second upper current switching circuit, each circuit comprising a pair of input transistors, whose emitters are connected together, each upper circuit having the bases of one of its input transistors connected to input signals, the bases of other two transistors of said upper circuits being connected to each other and to a bias voltage source, the emitters of said first upper circuit being connected to the collector of said first transistor of said lower circuit and the emitters of said second upper circuit being connected to the collector of said second transistor of said lower circuit, the

base of said first transistor being connected to a level shifted input signal and the base of said second transistor of said lower circuit being connected to a bias voltage source, wherein the improvement comprises:

a switch current source;

a plurality of idle current sources;

a plurality of fast response diodes, the anode of the first of said diodes being connected to the emitter of said first transistor of said lower circuit and to the first of said idle current sources and the cathode of said first diode being connected to the cathode of said second diode and to said switch current source, the anode of second diode being connected to the emitter of said second transistor of said lower circuit and to said second idle current source;

said diodes either conduct current from said switch current source through said transistors or block said switch current flow and allow idle current from said idle current sources to flow through said transistors, keeping said transistors turned on, thereby reducing said circuit's propagation delay time and eliminating glytch output signals from said circuit; and

said diodes also eliminate delay due to parasitic capacitance at the emitters of said transistors, thereby reducing the switching time of said transistors and the circuit's propagation time.

3,955,100

SIGNAL TRANSFER SYSTEM OF CHARGE TRANSFER DEVICE WITH CHARGE RETAINING CLOCKING PROVIDING FIXED TRANSFER TIME WITHIN VARIABLE TRIGGER PULSE TIME PERIOD

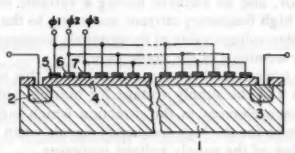
Kenji Takahashi, Ebina, and Shusaku Nagahara, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

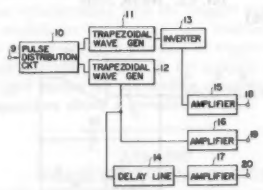
Filed Sept. 17, 1974, Ser. No. 506,835

Claims priority, application Japan, Sept. 17, 1973, 48-103833; July 5, 1974, 49-76378

Int. Cl.² H03K *4/94*; G11C *19/28*

U.S. Cl. 307—221 D **14 Claims**





1. A signal transfer system comprising:

a charge transfer device including a plurality of charge transfer stages connected in cascade, each stage having a plurality of transfer electrodes and respective capacitances coupled therewith for effecting the transfer of charges, in response to transfer signals applied to said transfer electrodes;

input means for introducing charges into the initial capacitance of the first stage among said plurality of charge transfer stages;

output means for deriving an output from the last capacitance of the final stage among said plurality of charge transfer stages; and

potential supplying means, coupled to said transfer electrodes, for sequentially applying to said transfer electrodes, during a fixed transfer period of time within a variable period of time corresponding to a delay period, a first clock signal for transferring charges to the capacitance associated with the initial transfer electrode of a respective transfer stage, and for applying to the initial transfer electrode of said respective transfer stage, during the remaining portion of said variable period of time, a second clock signal for retaining charges in the capacitance associated with said initial transfer electrode of said respective transfer stage.

3,955,101

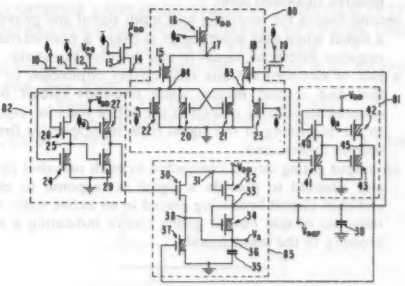
DYNAMIC REFERENCE VOLTAGE GENERATOR

Gilbert F. Amelio, Saratoga, and James M. Early, Palo Alto, both of Calif., assignors to Fairchild Camera and Instrument Coporation, Mountain View, Calif.

Filed July 29, 1974, Ser. No. 492,649

Int. Cl.² H03K *5/20*; G11C *19/28*; H03K *5/18*, *3/353*

U.S. Cl. 307—235 H **9 Claims**



1. A reference voltage generator for use in combination with a charge-coupled memory device of the type having a plurality of charge storage elements connected in a standard data string and a differential sense amplifier means for detecting the amount of charge in a selected charge storage element comprising:

means for generating a charge whose magnitude lies approximately midway between a first charge representing one selected binary logic state and a second charge representing the other binary logic state in said charge-coupled memory device;

comparison means electrically coupled to both said means for generating a charge and an instantaneous reference voltage signal for detecting the relative magnitude therebetween and generating selectively an incremental correction voltage signal on a selected one of two outputs; and,

feedback voltage generation means electrically coupled to said outputs on said comparison means for generating and incrementally adjusting said instantaneous reference voltage signal in response to said incremental correction voltage signal, whereby the instantaneous reference voltage lies approximately midway between the voltages

associated respectively with the stored charges representative of the two binary logic states in the charge-coupled memory device.

3,955,102

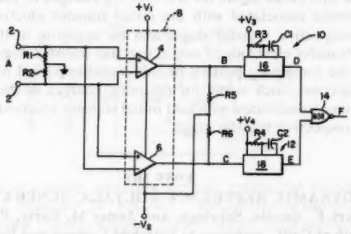
ZERO CROSSING DETECTING CIRCUIT

Chao S. Chi, Shrewsbury, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 417,995, Nov. 21, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 570,309

Int. Cl.² H03K *5/153*

U.S. Cl. 307—235 E **5 Claims**



1. A circuit for indicating zero-crossings in an input signal comprising:

first means for receiving said input signal and providing a signal when said input signal is above a predetermined positive threshold level;

second means for receiving said input signal and providing a signal when said input signal is below a predetermined negative threshold, equal to said positive threshold;

a pair of one-shot circuits respectively connected to said first and second means, each one-shot circuit being adapted to become placed in the active state in response to the beginning of the signal from its respective first or second means; and

an output gating circuit connected to each one-shot circuit and adapted to provide a signal in response to either one-shot circuit becoming placed in an active state, each response of said output gating circuit indicating a zero-crossing in the input signal.

3,955,103

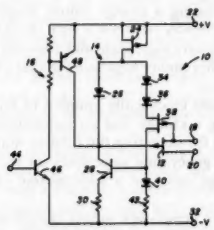
ANALOG SWITCH

Ronald W. Russell, Sunnyvale, and Daniel D. Culmer, Santa Clara, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 12, 1975, Ser. No. 549,195

Int. Cl.² H03K *17/66, 17/68*

U.S. Cl. 307—251 **5 Claims**



1. An analog switch for connecting two points in a signal path, comprising

a. a first FET having its source electrode connected to one of said points and its drain electrode connected to the other of said points in said signal path,

b. a current source,

c. first means for producing a voltage drop connected between said source electrode and said current source,

d. second means for producing a voltage drop connected between said gate electrode and said current source,

e. means connected to said first and to said second means for maintaining said voltage drops equal to one another in the absence of an external voltage applied to said gate electrode, such that the potential of said source electrode remains approximately equal to the potential on said gate electrode with variations in the amplitude of a signal applied at said points, and

f. means for connecting such an external voltage to said gate to render said FET substantially nonconductive.

3,955,104

SYNCHRONOUS CONTROL DEVICE FOR A STATIC RELAY BY A HIGH FREQUENCY SIGNAL

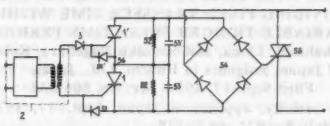
Guy H. Dumas, Paris, France, assignor to Silec-Semi-Conducteurs, Paris, France

Filed Nov. 19, 1974, Ser. No. 525,111

Claims priority, application France, Nov. 30, 1973, 73.42862

Int. Cl.² H03K *17/60*

U.S. Cl. 307—252 UA **9 Claims**



1. A synchronous control circuit for a static switch comprising

a serial connection comprising a high frequency source, a capacitor, and an element having a variable impedance for the high frequency current according to the instantaneous bias voltage value at its terminals, connected to the control terminals of the static switch;

a resistor connected between a terminal of this serial connection and the supply voltage for biasing said variable impedance element in the direction which increases its impedance for the high frequency signals when the absolute value of the supply voltage increases.

3,955,105

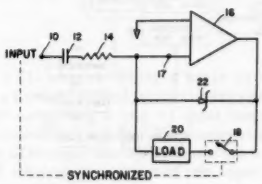
SYNCHRONOUS DETECTOR

James C. Defendorf, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed July 19, 1974, Ser. No. 489,862

Int. Cl.² H03K *5/00*

U.S. Cl. 307—261 **6 Claims**



1. A synchronous detector circuit for providing a direct current output signal as a function of an alternating current input signal, comprising:

an operational amplifier having an input summing junction and an output terminal;

feedback circuit means including a semiconductor connected between the input summing junction and the output terminal of the amplifier;

a current load element connected to the summing junction; and

switching means connected to the current load element and the output terminal of the amplifier for alternately providing current flow through the semiconductor and the current load element in synchronism with the alternating current input signal to produce a direct current output voltage signal across the current load element as a function of the alternating current input signal.

3,955,106

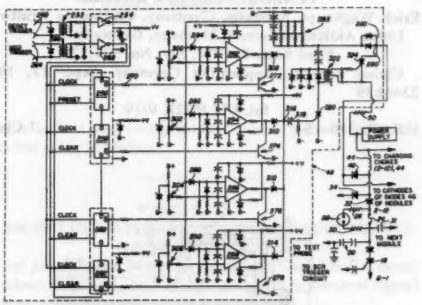
MULTIPLE DE-Q-ING CIRCUIT FOR A MOVING TARGET INDICATOR RADAR SYSTEM

Johnny L. Berry, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 3, 1973, Ser. No. 421,298

Int. Cl.² H03K *5/01*

U.S. Cl. 307—268 **5 Claims**



1. A system for reducing time and amplitude jitter in a stagger mode radar modulator comprising:

a. a plurality of capacitors coupled in parallel and means for charging the plurality of capacitors;

b. a plurality of trigger means, each of said plurality of trigger means operably coupled to the output of the plurality of capacitors and to a reference voltage, the reference voltage for each of the plurality of trigger means being of a different magnitude, whereby an output signal for each of said plurality of trigger means is produced only when the output of the plurality of capacitors exceeds the magnitude of the reference voltage;

c. a corresponding plurality of electrical gates operably coupled to the plurality of trigger means;

d. means synchronized with the stagger mode operation of said modulator for sequentially enabling said gates to open sequentially the plurality of trigger means; and

e. means operably coupled to the outputs of said plurality of trigger means for preventing charging of the plurality of capacitors above a preselected level.

3,955,107

PHASE SWITCHING DEVICE

Masayoshi Okabe, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 25, 1975, Ser. No. 571,689

Claims priority, application Japan, May 10, 1974, 49-52111

Int. Cl.² H03K *17/00*; **H04N** *5/04*

U.S. Cl. 307—295 **6 Claims**

1. A phase switching device comprising:

a semiconductor device having a first semiconductor region of one conductivity type,

a second semiconductor region of the opposite conductivity type adjacent said first region with a first semiconductor junction therebetween,

a third semiconductor region of the same conductivity type of said first region adjacent said second region with a second semiconductor junction therebetween, first, second and third terminals coupled to said first, second and third regions, respectively;

a fourth terminal connected to said semiconductor device and having at least a portion thereof located adjacent to said first region at a position which is spaced from the said first terminal, and an insulating layer separating said fourth terminal from said first region,

means for applying a low frequency switching signal between said first and fourth terminals,

means for superimposing a high frequency signal onto said low frequency signal,

said semiconductor device having an emitter grounded amplification characteristic which has a relatively low point with steeply increasing segments extending substantially symmetrically therefrom at both sides thereof in response to linear changes in voltage between said first and fourth terminals.

bias means for establishing the dc voltage between said first and fourth terminals to be of such a value as to cause said device to operate at said relatively low point of said emitter grounded amplification characteristic, and

means for biasing said device into a continuously conducting state.

3,955,108

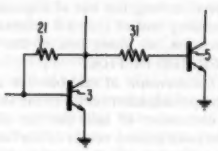
TRANSISTOR AMPLIFIER STAGE WITH DEVICE IN ITS TEMPERATURE COMPENSATED BIAS NETWORK USED AS PRELIMINARY AMPLIFIER

John Brewer Beck, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 15, 1972, Ser. No. 289,355

Int. Cl.² H03K *1/04*; **H03F** *3/343*

U.S. Cl. 307—297 **1 Claim**



1. In a direct coupled cascade connection before an output grounded-emitter transistor amplifier stage including a transistor having a base electrode, having an emitter electrode directly connected to a point of reference potential and having a collector electrode coupled through a first resistive means of given value to a source of operating potential, an input grounded-emitter transistor amplifier stage for temperature stabilizing the quiescent collector current of said transistor, said input common-emitter transistor amplifier stage comprising:

a further transistor having a collector electrode, having an emitter electrode directly connected to said point of reference potential, and having a base electrode for receiving an input signal applied for causing an output signal at the collector electrode of said transistor included in said output grounded-emitter transistor amplifier stage, which output signal is related over at least a portion of its range substantially linearly with said input signal;

means for direct current coupling the collector electrode of said further transistor to the base electrode of the transis-

tor within said output grounded-emitter transistor amplifier stage to apply amplified input signal thereto;

second resistive means coupling the collector electrode of said further transistor to said source of operating potential; and

third resistive means connected between said collector and base electrodes of said further transistor and providing substantially the sole direct current conductive path external of said further transistor connected to the base electrode of said further transistor and wherein:

said means for coupling the collector electrode of said further transistor to the base electrode of said transistor stage includes fourth resistive means of a value offsetting the temperature compensation provided by the arrangement of said third resistive means and said further transistor.

3,955,109

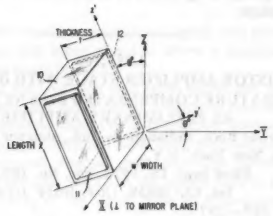
CRYSTAL RESONATOR OF (YZW)θ ORIENTATION HAVING A THICKNESS TO WIDTH RATIO OF LESS THAN ONE

Albert Anthony Comparini, Bethlehem, and John Joseph Gallo, Center Valley, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 29, 1974, Ser. No. 528,037

Int. Cl.² H01L 41/18

U.S. Cl. 310—9.5 **6 Claims**



1. A single crystal rectangular bar of trigonal material having 3m point symmetry and of (yzw) θ orientation having

the width dimension, *w*, along one of the crystal X axes

CHARACTERIZED IN THAT

the thickness, *t*, dimension of said bar lies along an axis *y'* parallel to the polarization vector of the slow shear mode;

the length, *l*, dimension of said bar lies along an axis *z'* parallel to the polarization vector of the fast shear mode;

and in that the ratio of the thickness of said bar to the width of said bar is less than unity.

3,955,110

JUNCTION CONNECTION PIECE FOR HOLLOW STRANDS OF THE STATOR CONDUCTOR BARS OF A DYNAMO-ELECTRIC MACHINE

Urs Karlen, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

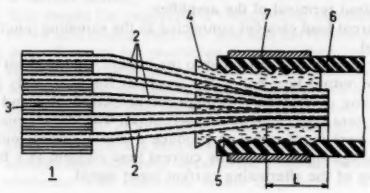
Filed Feb. 3, 1975, Ser. No. 546,419

Claims priority, application Switzerland, Mar. 15, 1974, 3608/74

Int. Cl.² H02K 9/16

U.S. Cl. 310—54 **4 Claims**

1. In a dynamo-electrical machine of the type wherein the stator winding thereof is comprised of stator bars composed of a combination of solid and hollow strands through which a fluid coolant is circulated and wherein the end portions of the hollow conductor strands of each bar protrude beyond the ends of the solid conductor strands thereof, the improvement wherein said protruding end portions of the hollow conductor strands are grouped together in a conductor bundle and which latter is encased in a cast-on body of synthetic resin that serves as an electrically insulating nipple for connection of the bundle of hollow conductor strands to fluid conduction means for circulation of the fluid coolant.



3,955,111

DEVICE FOR COOLING EXCITATION-CURRENT SUPPLY LINES IN LIQUID-COOLED TURBOGENERATOR ROTORS

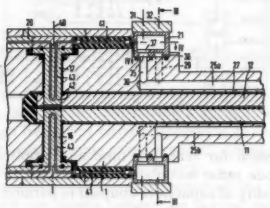
Erich Weghaupt, Mulheim, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed Sept. 9, 1974, Ser. No. 504,279

Claims priority, application Germany, Sept. 17, 1973, 2346639

Int. Cl.² H02K 9/19

U.S. Cl. 310—54 **7 Claims**



1. Device for cooling excitation-current supply lines in a shaft connected at one end thereof to a liquid-cooled turbogeneration rotor having coil windings mounted thereon, the excitation-current supply lines being disposed in bifilar fashion within a bore formed along the axis of the shaft, comprising coolant supply and discharge channels for the coil windings extending in the shaft coaxially to the excitation supply lines and terminating in coolant collecting chambers at the rotor end of the shaft, coolant supply and discharge channels subdivided into a multiplicity of individual subchannels extending in the shaft at minimal spacing from the axial bore for the excitation-current supply lines, said subchannels terminating through radial bores with said coolant collecting chambers at the rotor end of the shaft.

3,955,112

HERMETICALLY SEALED ROTOR

Otto W. Sell, 2201 E. Ash St., Deming, N. Mex. 88030

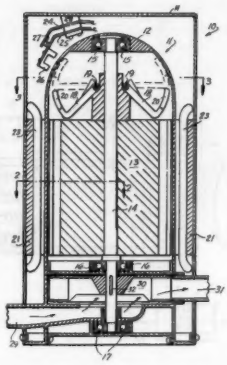
Filed Jan. 24, 1975, Ser. No. 543,872

Int. Cl.² H02K 5/10

U.S. Cl. 310—86 **3 Claims**

1. A rotor in combination with a stator to form an electric motor comprising a core, windings in the core, a shaft through said core for rotatably mounting said core, a copper shield

completely surrounding and hermetically sealing the core, a plurality of L-shaped arms pivotally attached at their ends to



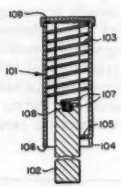
the core so that they swing outward toward the copper shield when the rotor is turning.

3,955,113

BRUSH HOLDER WITH MEANS FOR LIMITING TRAVEL OF BRUSH SPRING

Michael John Hillyer, Mechanicsburg, and Christian Raymond Carlson, Dillsburg, both of Pa., assignors to General Signal Corporation, Rochester, N.Y.

Filed Nov. 27, 1974, Ser. No. 527,566
Int. Cl.² H02K 13/00
U.S. Cl. 310—245 7 Claims



1. A commutator brush assembly comprising in combination;

a a brush;

b a brush holder having a first section for retaining and confining said brush for reciprocal longitudinal motion with respect to said brush holder;

c spring means captured within a second section of said brush holder and co-acting with one end of said brush for urging the other end of said brush to project from said brush holder when said brush is assembled in said first section of said brush holder; and

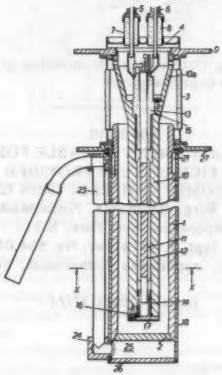
d retaining means comprising a bent tab section of said brush holder for limiting the maximum extension of said spring means.

3,955,114

MAGNETICALLY FOCUSED ELECTRON BEAM TUBE

Joshua J. Behenna, Brixham, and Graham Harold George Phipps, Totnes, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed June 21, 1974, Ser. No. 483,854
Claims priority, application United Kingdom, July 10, 1973, 32781/73
Int. Cl.² H01J 7/26
U.S. Cl. 313—36 6 Claims



1. A magnetically focused electron beam power tube comprising a tubular anode, a cathode extending axially in the anode and a rigid elongate conductive member extending axially in the anode between said anode and cathode, said member forming both a control electrode and a main structural support member for said cathode, intermediate insulating spacers between said cathode and control electrode, said spacers physically supporting said cathode from said control electrode, one of said spacers allowing differential thermal expansion between the cathode and the control electrode, and means for applying potential between said anode, control electrode and cathode to form an electron beam, said control electrode having a transverse slot extending axially on opposite sides of said cathode for directing said electron beam from said cathode toward opposite sides of said anode said anode being a single integral electrode surrounding said control electrode and cathode.

3,955,115

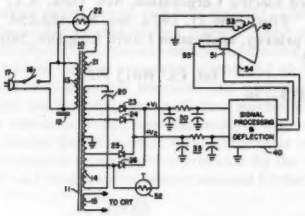
COLOR TELEVISION WITH VRT AND AUTOMATIC DEGAUSSING

Hans E. Manske, Addison, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 3, 1975, Ser. No. 538,633
Int. Cl.² H01J 29/06, 31/20
U.S. Cl. 315—8 6 Claims

1. A color television receiver comprising: signal processing and deflection circuitry; a picture tube including permeable material subject to being magnetized by extraneous magnetic fields; a voltage regulating transformer having a saturable core and a primary and secondary winding for supplying current at a regulated voltage to said circuitry; degaussing means including a degaussing coil positioned adjacent to said picture tube for periodically developing an alternating magnetic field of

diminishing strength for demagnetization of said permeable material; and means temporarily altering the operation of said



voltage regulating transformer for enabling greater current flow through said degaussing coil.

3,955,116

CIRCUIT ARRANGEMENT SUITABLE FOR USE IN A TELEVISION PICK-UP TUBE PROVIDED WITH AN ANTI-COMET TAIL ELECTRON GUN

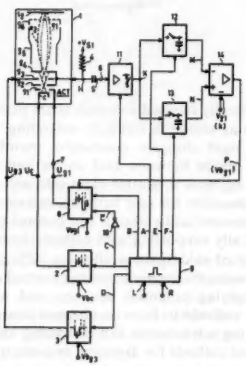
Wouter van den Berg, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,057

Claims priority, application Netherlands, Sept. 7, 1973, 7312332

Int. Cl.² H01J 31/26

U.S. Cl. 315—10 9 Claims



1. A circuit arrangement suitable for use in a television pick-up tube provided with an anti-comet tail electron gun, formed with a cathode, a control electrode, anode electrodes and a lens electrode for generating during line scan times and line flyback times an electron beam having different values for the beam diameter, beam current intensity and beam potential upon impingement of a target present in the tube under the control of a control voltage between the control electrode and the cathode having a cathode potential and a lens voltage between the lens electrode and an adjacent anode electrode, one line period being constituted by the line scan time and a line blanking time comprising the line flyback time and a beam blanking time, said circuit arrangement comprising an input means for coupling generator including a potential divider having a plurality of connection points, a plurality of switch means for coupling said points to the output of the variable pulse generator under the control of a switching signal, the potential divider including a controllable resistor coupled to said first input, further being coupled to said second input to which the adjustable source is coupled.

3,955,117

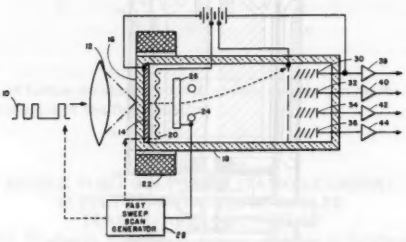
OPTICAL PULSE DEMODULATOR

Edward H. Eberhardt, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 30, 1975, Ser. No. 545,267

Int. Cl.² H01J 31/48

U.S. Cl. 315—11 5 Claims



1. An optical pulse demodulator comprising:

a source of modulated optical radiation pulses having a given repetition rate and time relationship between pulses,

an optical cathode ray tube having a transparent faceplate at one end,

an electron emissive photocathode on the inner surface of said faceplate receiving said optical pulses and emitting corresponding electron pulses,

a plurality of electron multiplier output channels positioned at the other end of said tube and spaced along a given path in correspondence with said time relationship between pulses,

means for directing and focusing said electron pulses onto said output channels,

deflection means for rapidly scanning said electron pulses across said plurality of output channels successively, and

means applying a sweep signal to said deflection means, said sweep signal being synchronized with said repetition rate and time relationship of said pulses so that each of said plurality of pulses occurring during a given time interval is demodulated by a respective electron multiplier channel.

3,955,118

COLD-CATHODE ION SOURCE

John Peter Wilfred Flemming, Hopewell Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 19, 1975, Ser. No. 551,217

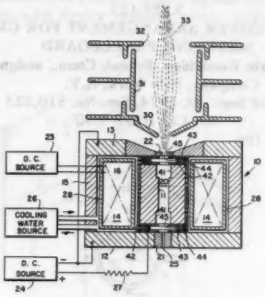
Int. Cl.² H01J 1/30, 3/04, 3/40, 7/24

U.S. Cl. 315—111.8 7 Claims

1. An improved cold-cathode ion source comprising: a hollow anode, at least one substantially planar cathode separated from one end of the anode by insulating means and having an aperture therein substantially coaxial with the bore of the anode, and means for creating an axial magnetic field in the bore of the anode, wherein the improvement comprises:

the insulating means comprises a body of insulating material having an aperture therein substantially coaxial with the

bore of the anode and at least one circumferential groove in the wall of the aperture to inhibit the formation of



conducting bridges of sputtered material between the anode and the cathode.

3,955,119

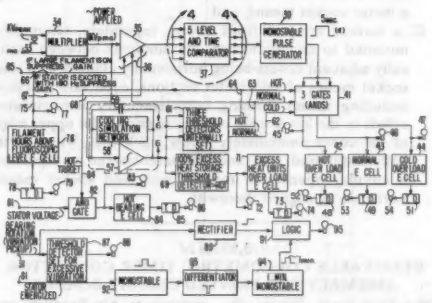
APPARATUS FOR PREDICTING INCIPIENT FAILURE OF AN X-RAY GENERATOR TUBE

John T. Perry, Salt Lake City, Utah; James A. Grichnik, Park Ridge, and Joel J. Schmutzer, Oak Park, both of Ill., assignors to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 327,259, Jan. 29, 1973, abandoned. This application Oct. 11, 1974, Ser. No. 514,157

Int. Cl.² H05G *1/30*

U.S. Cl. 315—133 **22 Claims**



1. An apparatus for predicting failure of an X-ray generator tube, comprising:

means for monitoring a failure inducive operating condition of said tube,

means for deriving an output signal indicative of the value of said failure inducive operating condition,

means for generating a failure mode output when said output signal exceeds a predetermined value,

means for integrating successive failure mode outputs, and

means for indicating a value of said integrated failure mode outputs.

3,955,120

CIRCUIT FOR DIGITALLY CONTROLLING THE BRIGHTNESS OF THE ELECTRON BEAM OF AN ELECTRON BEAM DEFLECTION TUBE

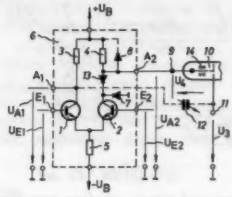
Heinrich Jurgensen, Raisdorf, Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Kiel, Germany

Filed Apr. 25, 1974, Ser. No. 463,879

Claims priority, application Germany, Apr. 26, 1973, 2320965

Int. Cl.² H01J *25/52*

U.S. Cl. 315—385 **2 Claims**



1. A circuit for digitally controlling the brightness and darkness of an electron beam of an electron beam tube having a cathode and control grid, said circuit comprising, in combination:

a differential amplifier including input and output transistors each having an emitter, base, and collector;

a first D.C. voltage source having a substantially constant voltage amplitude connected between said control grid and ground;

a second D.C. voltage source having a substantially constant voltage amplitude connected between the base of said output transistor and ground;

a third D.C. voltage source having a positive terminal;

a first resistor connected between said positive terminal and the collector of said input transistor;

a first diode having its cathode connected to the collector of said output transistor;

a second resistor connected between said positive terminal and the anode of said first diode;

the resistance of said first resistor being smaller than said second resistor;

a second diode having its cathode connected to the collector of said output transistor and its anode connected to ground; and

a third diode having its cathode connected to said positive terminal and its anode connected to the anode of said first diode, whereby the base of said input transistor can be supplied with a digital signal for controlling the brightness and darkness of said electron beam.

3,955,121

SHORT-CIRCUIT PROTECTIVE SYSTEMS

Thomas J. Vahey, 2905 Brunswick Rd., Youngstown, Ohio 44511

Filed Sept. 16, 1974, Ser. No. 506,518

Int. Cl.² H02H *3/28*

U.S. Cl. 317—13 R **11 Claims**

1. A short-circuit protective system for a polyphase dynamoelectric machine responsive to power cable-to-ground short-circuits and also to phase winding-to-ground and phase-to-phase short-circuits, comprising:

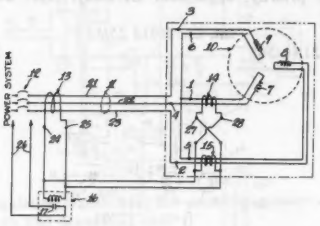
a circuit breaker for controlling flow of electricity in a polyphase cable electrically connected to said machine,

a trip relay for controlling trip operation of said circuit breaker,

a ground current transformer connected to said relay and sensitive to current flowing to ground from said polyphase cable and the polyphase windings of said machine extending from said cable, said ground current trans-

former when sensitized causing said trip relay to open said circuit breaker,

differential current transformer means connected to said relay and sensitive to short circuits from a phase winding-to-ground and to phase-to-phase short-circuits, said transformer means when sensitized causing said trip relay to open said circuit breaker, and,



means causing said phase winding transformer means to have a secondary output to said trip relay electrically different from the secondary output of said ground current transformer upon the occurrence of any said short-circuit,

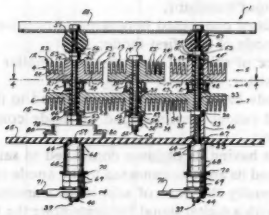
thereby to trip said relay notwithstanding the common connection of said transformers thereto.

3,955,122

HEAT SINK MOUNTING FOR CONTROLLED RECTIFIERS

John T. Maynard, New Berlin, and Gilbert A. Schwibinger, Oconomowoc, both of Wis., assignors to Armor Elevator Company, Inc., Louisville, Ky.

Filed Feb. 26, 1974, Ser. No. 445,987
Int. Cl.² H01L *23/34*
U.S. Cl. 317—100 **30 Claims**



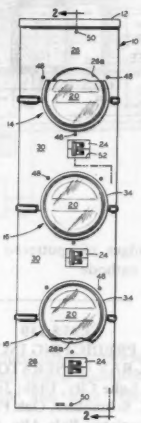
1. An assembly, comprising electric power rectifying means, first heat sink means including a first member having a plurality of spaced first cooling fins providing a first cooling fluid passageway and a second member having a plurality of spaced second cooling fins providing a second cooling fluid passageway with said first and second heat sink members spaced substantially within a common first plane and abutting a first side of said rectifying means, second heat sink means including a third member located within a second plane and providing a plurality of spaced third cooling fins providing a third cooling fluid passageway and abutting a second side of said rectifying means, said rectifying means including a first rectifying device sandwiched between said first and third heat sink members and a second rectifying device sandwiched between said second and third heat sink members, said first, second and third cooling fins aligned substantially in parallel and permitting unidirectional coolant flow through said first, second and third fluid passageways provided by said first, second and third heat sink members, respectively, means securing said first and second heat sink means in spaced relationship with respect to each other and in engagement with said rectifying means, and means operatively connected to said rectifying means and supplying a first current frequency input and a second current frequency output.

3,955,123

MULTIPLE COVER ARRANGEMENT FOR GROUPED METERING PANELBOARD

Lawrence Carvin Goodridge, Bristol, Conn., assignor to General Electric Company, New York, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,223
Int. Cl.² H02B *9/00*
U.S. Cl. 317—106 **7 Claims**



1. A grouped metering panelboard comprising in combination:

A. an upright, vertically elongated enclosure;

B. a plurality of vertically stacked meter sections accommodated in said enclosure, each said meter section including a meter socket means; and

C. a vertical array of front covers, separately, removably mounted to said enclosure, the junctions between vertically adjacent covers being horizontally aligned with said socket means of said meter sections, each said junction including means forming complementary semi-circular reliefs in the lower edge of one cover and the upper edge of the cover immediately below, such that, when vertically juxtaposed, said junction therebetween incorporates a circular opening in registry with said socket means horizontally aligned therewith.

3,955,124

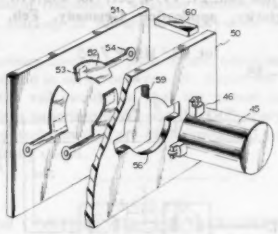
REMOVABLE COULOMETRIC TIMER CONNECTOR ASSEMBLY FOR PRINTED CIRCUIT BOARDS

John Paul Jones, Wayne, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 10, 1975, Ser. No. 548,444
Int. Cl.² H02B *1/04*
U.S. Cl. 317—120 **7 Claims**

1. Means for removably holding an electrical device in an electric circuit, comprising in combination: an electrical device; a planar printed circuit board having thereon a plurality of conductive terminal ends mating with said electrical device, and a planar insulating panel member parallel to and spaced from said printed circuit board a predetermined distance X said insulating panel member spaced apart from and fastened to said circuit board by a plurality of spacers having a length X equal to the distance X which separates said panel and said board; said panel having defined therein a generally circular

aperture in which said electrical device is removably mounted, and said aperture is in registration with said terminal ends with a plurality of keyway slots extending radially therefrom; said electrical device comprising an insulated housing with a generally circular housing configuration terminating at an open end with a plurality of radially extending tabs mating with said keyway slots, said device residing within said housing with



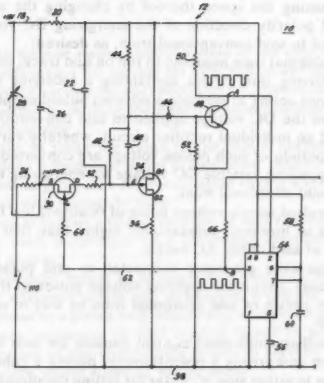
wire leads radially extending along the length of said tabs and crimped over the ends thereof, said tabs and said wire leads having a combined maximum thickness slightly exceeding X to thereby permit said tabs to enter said slots and be rotated to extend between said printed circuit board and said panel for frictionally holding said device in place with said wire leads in electrical contact with said terminal ends.

3,955,125

FAIL-SAFE ACTIVE TIMING CIRCUIT

William K. Butler, and Robert F. Anderson, both of Rochester, N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Feb. 21, 1975, Ser. No. 551,817
Int. Cl.² H03K *17/26*
U.S. Cl. 317—141 S **8 Claims**



1. A fail-safe timing circuit for providing a variably selectable delay period before a control device operates, comprising:

a passive timing element having an inherent discharge period for establishing a delay for a control signal;

a control device whose operation is to be affected by said control signal;

an active timing device operative in response to charge present on said passive element so as to perform repetitively its predetermined timing cycle;

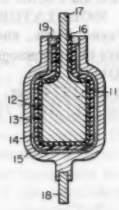
a translating device connected between said passive element and said active timing device so as to translate or extend the inherent discharge period of the passive element, said translating device having a small ratio of ON time to OFF time such that a very small change in charge on the passive element is effected for each cycle of the timing device.

3,955,126

ELECTROLYTIC CAPACITOR WITH COMBINED SOLID ELECTROLYTE OF TCNQ SALTS AND NITROGEN-CONTAINING POLYMERS OF MODERATE MOLECULAR WEIGHT

Mutsuaki Murakami; Masahito Yasuda, and Susumu Yoshimura, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Oct. 9, 1974, Ser. No. 513,265
Claims priority, application Japan, Oct. 12, 1973, 48-115230
Int. Cl.² H01G *9/00*
U.S. Cl. 317—230 **5 Claims**



1. In a solid electrolyte capacitor having a dielectric oxide film formed on a first electrode of an anodically oxidizable metal, a second electrode and a solid electrolyte layer formed between and in intimate contact with both electrodes, the solid electrolyte containing a semiconductive salt of 7,7,8,8-tetracyanoquinodimethane(TCNQ) and a nitrogen-containing polymer capable of dissolving the salt of TCNQ, the improvement comprising utilizing for said polymer, a polymer having a mean molecular weight in the range between 2,000 and 200,000 and in an amount of to 2 to 10% by weight of said salt of TCNQ.

3,955,127

METHOD OF MANUFACTURING ELECTRICAL CAPACITORS AND THE ELECTRICAL CAPACITORS FORMED BY THE METHOD

Delbert E. Hunt, Ogallala, Nebr., assignor to TRW Inc., Ogallala, Nebr.

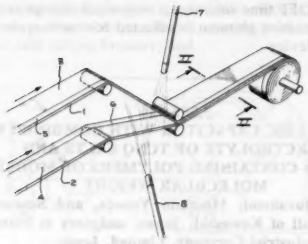
Filed Apr. 25, 1975, Ser. No. 571,578
Int. Cl.² H01G *4/14*
U.S. Cl. 317—258 **7 Claims**

1. In a method of manufacturing capacitors including winding elongated thermoplastic dielectric film having a conductive coating associated therewith and then applying heat to the winding to shrink the thermoplastic material to tighten the winding, the improvement in the method comprising:

depositing volatile liquid on said film during winding thereof to act as a lubricant between successive layers of said film, said liquid having the following properties:

a. a boiling point below the temperature at which said

film or said coating will be damaged;
b. lack of a residue after evaporation; and



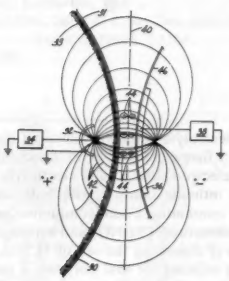
c. non-corrosiveness to the film and coating.

3,955,128

CHARGED PARTICLE OPTICAL SYSTEM FOR CURVED MODULATORS

Alexander C. Wu, Wayne, Mich., and Shou L. Hou, Chagrin Falls, Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed July 31, 1974, Ser. No. 493,206
Int. Cl.² H01T *19/00*
U.S. Cl. 317—262 A **13 Claims**



5. In a copying apparatus equipped with a modulator having a curvilinear profile with inside and outside surfaces and having a charge distribution system thereon, the combination comprising,

a conductive collecting electrode having a curvilinear profile generated by a radius of curvature that is the same as said modulator with inside and outside surfaces and positioned proximate to and in spaced relation from said modulator with their respective outside surfaces facing one another,

a high voltage source for applying potential to said collecting electrode of one polarity, and a gas ion generating source positioned adjacent the inside surface of said modulator projecting ions having a polarity opposite the polarity of the potential applied to said collecting electrode; and

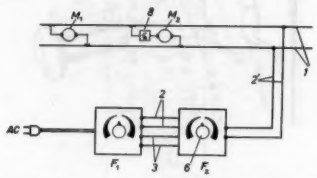
means for advancing dielectric paper across the outside surface of said collecting electrode, whereby a high intensity field is established between said outside surface of said collecting electrode and the gas ion generating source.

3,955,129

ARRANGEMENT FOR CONTROLLING SIMULTANEOUSLY SEVERAL ELECTRIC TOYS BY A SINGLE CIRCUIT

Karlhorst Wagner, Rothenbach, and Hellmut Zorn, Neutras, both of Germany, assignors to DEG Datensysteme und Electronic Gesellschaft Ingenieurbuero; K. Waegner and H. Zorn, all of Roethenbach, Germany

Filed Jan. 21, 1974, Ser. No. 435,118
Claims priority, application Germany, Feb. 2, 1973, 2305112
Int. Cl.² H02P *7/68*
U.S. Cl. 318—55 **1 Claim**



1. A model train system comprising apparatus for converting a conventional single electric model DC train set having a conventional remote control console for operating of such single train from any conventional AC utility current supply outlet on track rails comprising the energizing and control signal circuit thereof; to a multi-train/common track system having an individual remote control console for each train added thereon, so that the trains can be simultaneously and individually controlled in speed and direction without any electrical interference therebetween; comprising

an input circuit cable plug for connecting the system to a conventional AC utility outlet source of supply voltage for driving and controlling the conventional train by means of the conventional train control console for starting the conventional train in a selected direction and adjusting the speed thereof by changing the amplitude and polarity direction of the energizing DC voltage applied to said conventional train, as desired;

an additional train mounted to run on said track, comprising a driving unit circuit containing a receiving capacitor circuit acting to separate a selected pulsed supply voltage from the DC voltage applied to said conventional train, and an individual rectifier circuit, whereby variations in amplitude of such pulsed voltage are converted to a corresponding variable DC voltage for energizing the motor of said additional train;

such pulsed supply voltage being of relatively low frequency that is, however, substantially higher than that (25 – 60 H) of said utility AC outlet;

a pulse-wave generator connected to said pulsed supply voltage circuit for applying voltage pulses to the driving unit circuit of said additional train by way of said track; and

an auxiliary individual control console for said additional train comprising a potentiometer having a contact movable to either side of center for setting the direction of the polarity and amplitude of the pulses applied to the driving unit circuit of said additional train for controlling the direction and speed of the latter on said track; and capacitor and inductor means associated with said DC and pulsed supply circuits, respectively, for protecting the pulsed circuit from direct current of the former, and for protecting the DC circuit from alternating current of the pulsed supply circuit, when both trains are operated on said track;

such pulsed supply voltage being in the form of nonsymmetrical half waves having a time-average value of substantially zero, whereby the difference voltages of both maxi-

mum values serves for determining the direction of the so-controlled vehicle;

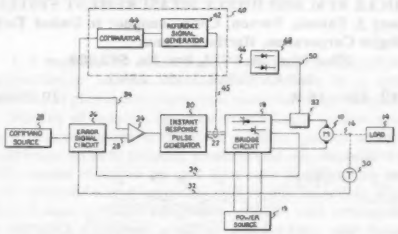
the pulse repetition frequency being equal to a multiple of that of the AC utility line outlet supply, thereby providing a sufficiently high voltage for reliable starting and acceleration of the additional train, providing that when the amplitude of the supply voltage pulses increases, the pulse width also increases at substantially fixed pulse repetition frequency, whereby smooth transition exists from start-up to full-speed steady-state voltage conditions;

said auxiliary control console of said additional train being connected in series between the circuit for the first train and the rail circuit, so that the pulsed supply voltage circuit is superimposed upon the DC supply voltage, and the control consoles are both connected to the common AC utility outlet.

3,955,130
MOTOR CONTROL CIRCUIT INCLUDING MOTOR CURRENT LIMITING MEANS

Carlton E. Graf, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Dec. 20, 1974, Ser. No. 534,671
Int. Cl.² H02P *7/06*
U.S. Cl. 318—332 **15 Claims**



1. In an electric motor control system of the type including controllable means for varying the effective power supplied to the motor for varying the operation thereof, means for limiting motor current by limiting the effective power delivered to the motor comprising:

a. means to sense the value of the motor current and to produce a feedback signal proportional thereto;

b. means to generate a reference signal having a value which varies with respect to time;

c. means to initiate a new generation of said reference signal with each occurrence of a prescribed condition within said system;

d. comparator means to compare said feedback signal and said reference signal and to produce a control signal in response to a prescribed relationship therebetween; and,

e. means responsive to said control signal to govern the operation of the controllable means to thereby vary the effective power supplied to the motor.

3,955,131
CIRCUIT FOR CONTROLLING THE REVERSE CURRENT IN A CONTROLLED RECTIFIER

Dante E. Piccone, Glenmoore, and Istvan Somos, Lansdowne, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

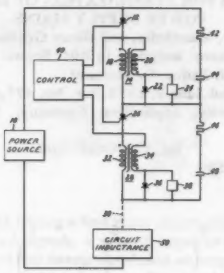
Filed Sept. 8, 1975, Ser. No. 611,474
Int. Cl.² H02M *7/00*
U.S. Cl. 321—25 **10 Claims**

1. A circuit for controlling current flow between a source and a load comprising:

a. controlled rectifier means adapted to be connected in series with the source and the load for selectably controlling the flow of current from the source to the load;

b. a saturable reactor having primary and secondary windings wound on a core, said primary winding connected in series with the controlled rectifier and the load; and

c. impedance means connected in series with the saturable reactor secondary winding, the series combination of the impedance and the secondary winding being connected in parallel with the primary winding, said secondary winding

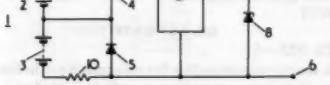


being poled so that current flowing from the source through the forward direction of the controlled rectifier and through the primary and secondary windings produce opposing flux in the core, said impedance means presenting a low impedance to current flowing in the forward direction of the controlled rectifier and in the secondary winding and a higher impedance to current flowing in the reverse direction of the controlled rectifier and in the secondary winding, whereby the duration of said reverse current flow can be adjusted by varying the magnitude of said higher impedance.

3,955,132
INTRINSICALLY SAFE POWER SUPPLY APPARATUS

Alan Norman Greenwood, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed June 18, 1974, Ser. No. 480,511
Claims priority, application United Kingdom, July 31, 1973, 36283/73
Int. Cl.² G05F *3/08;* **H02H** *9/00*
U.S. Cl. 323—15 **7 Claims**



1. Intrinsically safe portable power supply apparatus comprising a battery source, output terminals connected to the source, a zener diode connected across the source and the output terminals, a current limiting resistor means connected to the source and to the zener diode, in which the battery source is divided into a plurality of sections and including an equal plurality of unidirectional conducting elements, a separate one of said elements being connected across each section of the battery source, the current limiting resistor means comprising a current limiting resistor connected between an end section of the battery source and a unidirectional con-

ducting element, whereby the apparatus is rendered intrinsically safe, whereby upon a break at a first section of the battery, current from a remaining section flows around the first section through a unidirectional conducting element connected across the first section, avoiding high energy level sparking at the break, and whereby upon a break in an end section of the battery adjacent the current limiting resistor, that end section and the current limiting resistor are bypassed by the unidirectional element.

3,955,133
APPARATUS FOR STABILIZATION OF ELECTRICAL POWER SUPPLY MAINS

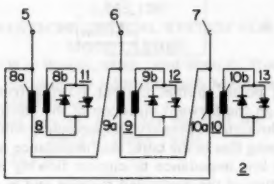
Dierk Schroder, Mannheim, and Dieter Grunberg, Viernheim, both of Germany, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed June 7, 1974, Ser. No. 477,470

Claims priority, application Germany, June 8, 1973, 2329287

Int. Cl.² G05F *3/00*

U.S. Cl. 323—50 **16 Claims**



1. Apparatus for stabilizing the effects of a single or multiphase alternating current consumer having a greatly fluctuating load characteristic on the alternating current supply main to which the consumer is connected comprising a leakage reactance transformer, the primary winding of said transformer being connected to said alternating current supply main in parallel with said consumer, and the secondary of said transformer being short-circuitable through a controllable semiconductor valve type regulator, and means controlling the firing angle of said controllable semiconductor valves in accordance with the change in the consumer load thereby to correspondingly vary the amount of short circuit current flowing through said secondary winding.

3,955,134
REACTANCE CONTROLLER

Dennis A. Woodford, 981 McMillan Ave., Winnipeg, Manitoba, Canada

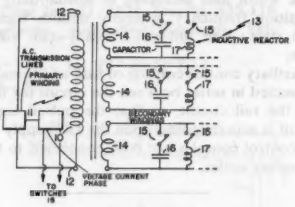
Filed Oct. 4, 1974, Ser. No. 512,355

Claims priority, application United Kingdom, Oct. 9, 1973, 47049/73

Int. Cl.² G05F *5/00*

U.S. Cl. 323—61 **12 Claims**

1. A reactance controller for incorporation in the secondary circuit of a power transformer which includes a secondary winding, said power transformer having a primary winding connected to an alternating current transmission line; comprising in combination means to control said controller in both the inductive and capacitive modes, said means including at least one capacitor and at least one inductor and switch means to switch said inductor and said capacitor together and separately in and out of the secondary circuit responsive to variations in voltage, current and phase of the AC current in said transmission line and means to minimize switch surges in said secondary circuit, said last mentioned means including a first conductor across said secondary winding, a capacitor connected in series with said conductor, a first switch and a second switch in said conductor on one side of said capacitor, a second conductor across said secondary winding, a high impedance element and an inductive reactance in series within said second conductor, a third switch between said high impedance element and one side of said secondary coil, fourth switch means between said high impedance element and said



inductive reactor, and a third conductor connected between said first and second conductors, and being connected to said first conductor between said first and second switches and to said second conductor between said high impedance element and said inductive reactance.

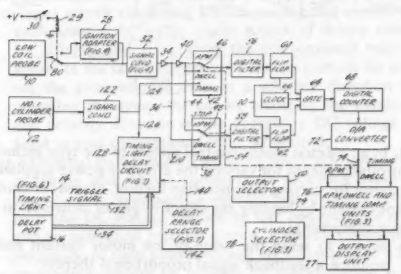
3,955,135
VEHICLE RPM AND DWELL MEASUREMENT SYSTEM

Anthony J. Fastaia, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,089

Int. Cl.² G01R *23/00*, *13/42*

U.S. Cl. 324—16 R **10 Claims**



1. A system for measuring the rpm and dwell angle of an internal combustion engine having a distributor for selectively supplying a spark voltage to a plurality of spark ignition devices comprising

means for generating a series of ignition pulses having a duration equal to the duration of the spark voltage supplied to each spark ignition device,

means for generating a series of clock pulses,

a counter connected to receive said series of clock pulses,

first means for enabling said counter upon the leading edge of said ignition pulses and for stopping said counter upon the next occurring leading edge of said ignition pulses, wherein said counter contains a first count proportional to engine rpm,

means for inverting said series of ignition pulses,

second means for enabling said counter upon the leading edge of said ignition pulses, and stopping said counter upon the next occurring leading edge of said inverted ignition pulses, wherein said counter contains a second count proportional to ignition dwell angle,

means for selectively connecting said first or second means with said counter,

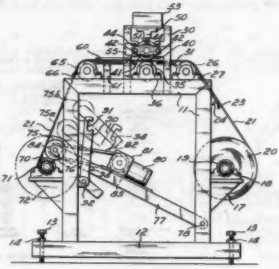
and data computation means connected with said counter for computing engine rpm and ignition dwell angle from said first and second counts.

3,955,136

MACHINE FOR DIELECTRICALLY DETECTING DEFECTS IN FLAT RUBBER STOCK

Arthur J. Wiltshire, Richmond Heights, and Henry U. Ranallo, Euclid, both of Ohio, assignors to Structural Fibers, Inc., Chardon, Ohio

Filed Nov. 20, 1974, Ser. No. 525,486
Int. Cl.² G01R *31/12*; B65H *17/08*
U.S. Cl. 324—54 **6 Claims**



1. A machine for continuously detecting and identifying the approximate location of dielectric defects in a specified amount of planar nonconductive material comprising a frame, a plurality of supports fastened to said frame so as to maintain said nonconductive material in position, guides attached to said frame so as to properly position said nonconductive material, means mounted on said frame for continuously moving said nonconductive material, said means including a gravity biased drive cylinder adapted to contact said nonconductive material, a dielectric analyzer mounted on said frame for detecting said dielectric defects, said analyzer designed to establish an area of relatively stable voltage potential between opposite sides of said planar nonconductive material, said voltage potential fluctuating in response to a dielectric defect within said area of voltage potential, said dielectric analyzer including a first metal cylindrical roller, said first roller being fixed on a lateral axis, and a second metal cylindrical roller, said second roller being movable along said lateral axis, each roller being maintained at a separate electric potential and mounted substantially parallel and adjacent to each other with the peripheries of said rollers opposed, said second roller being gravitybiased toward said first roller wherein the distance between said rollers is a function of the thickness of said planar nonconductive material which passes in a linear direction between said rollers, said lateral axis being perpendicular to said linear direction, and means to mark said material in response to fluctuations in said voltage potential for identifying the approximate location of said dielectric defects in said nonconductive material.

3,955,137

ADJUSTABLE FREQUENCY SCANNING SIGNAL PROCESSOR

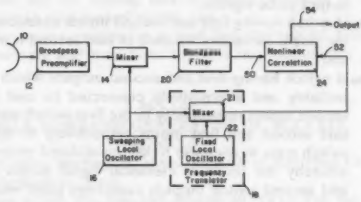
John B. Harrington, Los Alamitos, and Michael Waldner, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 2, 1974, Ser. No. 494,126
Int. Cl.² G01R *23/00*
U.S. Cl. 324—80 **10 Claims**

1. A signal processor adapted for producing output signals indicative of the relative frequency distribution of the energy contained in applied signals, said processor comprising:

first sweep generator means for producing a first sweep signal which linearly varies in frequency as a function of time;

second sweep generator means for producing a second sweep signal which varies linearly in frequency as a function of time and whose frequency versus time slope is opposite from the frequency versus time slope of said first sweep signal;



a signal mixer having a first input circuit adapted to receive said applied signals, a second input circuit coupled to receive said first sweep signal, and an output circuit; and

a nonlinear correlator having a first input port coupled to said signal mixer's output circuit, a second input port coupled to receive said second sweep signal and an output port; whereby

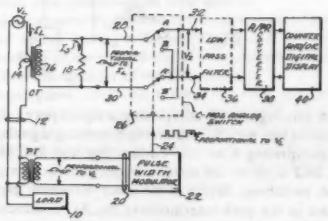
the output signal from said nonlinear correlator is indicative of the relative frequency distribution of the energy contained in the applied signals.

3,955,138

ELECTRONIC ENERGY CONSUMPTION METER WITH INPUT TRANSFORMER HAVING SINGLE RESISTANCE TERMINATED SECONDARY WINDING COUPLED TO C-MOS SWITCHES DRIVEN BY PULSE WIDTH MODULATED CONTROL SIGNALS

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,298
Int. Cl.² G01R *21/06*
U.S. Cl. 324—107 **8 Claims**



1. In an electronic energy consumption meter for monitoring electrical energy consumption represented by electric current and voltage signals according to the time-division or amplitude-mark-space-modulation method, the improvement comprising:

a first transformer having a primary winding connected to receive one of said signals to be monitored and a secondary winding providing a first signal proportional thereto,

a second transformer having a primary winding connected to receive the remaining one of said signals to be monitored and a single secondary winding providing a second signal proportional thereto,

a fixed resistance of predetermined value in the range of approximately 50 to 100 ohms connected in shunt across said secondary winding of said second transformer,

a pulse-width modulator operatively connected to receive said first signal and to produce repetitive modulated output pulse signals having instantaneous pulse-widths proportional to the corresponding instantaneous magnitude of said first signal, and

a double-pole double-throw electronic switch operatively connected to be automatically switched between two possible states in response to said repetitive modulated output pulse signals,

said switch having first and second inputs connected across the single secondary winding of said second transformer, and

said switch having first and second outputs which are controllably and alternatively connected to said first and second inputs respectively in the first switch state and to said second and first inputs respectively in the second switch state in response to said modulated output signals whereby the resultant electrical signal across said first and second switch outputs comprises pulse-widthamplitude modulated pulses having instantaneous widths proportional to said first signal, instantaneous amplitudes proportional to said second signal and a D.C. component proportional to the product of said first and second signals and hence to the power consumption represented by the monitored electric current and voltage signals.

3,955,139
ZEROING CIRCUIT

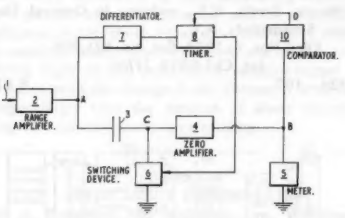
Anthony Jenkins, Linton, and Douglas Walter Isgrove, Cherryhinton, both of England, assignors to Analytical Instruments Limited, Royston, England

Filed July 15, 1974, Ser. No. 488,650

Claims priority, application United Kingdom, July 13, 1973, 33433/73

Int. Cl.² G01R *1/02, 1/30*

U.S. Cl. 324—130 **9 Claims**



1. A zeroing circuit comprising a signal path, an input connection to the path for receiving incoming signals, said signal path comprising a an AC conducting and DC blocking element and a meter in series connection therein, a normally closed switching device connected between ground and a position in the path intermediate the AC conducting and DC blocking element and the meter, a differentiator means for detecting a rate of change of incoming signals in said path and having input means connected to the signal path at a position intermediate the input connection and the AC conducting and DC blocking element, a timer means connecting the output of the differentiator means to said switching device and responsive to a differentiator means output when the rate of change of signal in the path exceeds a predetermined minimum for opening the switching device for a preset time interval and therewith allowing the signals in the signal path to proceed to the meter, said timer means including a reset input, a comparator circuit means having an input connected to the signal path at a position intermediate the switching device position and the meter and having an output coupled to the reset input of the timer means, the comparator circuit means being responsive to a signal magnitude on said signal path which is less than a predetermined magnitude for resetting the timer means to its initial condition, causing the switching device to close, and thereby isolating the meter from the incoming signals.

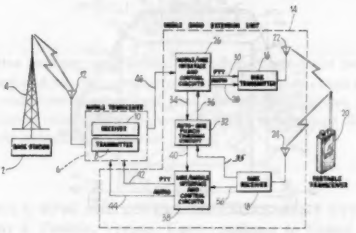
3,955,140
MOBILE RADIO EXTENSION UNIT WITH PUNCH THROUGH OPERATION

Berton H. Stephens, Los Altos, and Jack Bradley, Cupertino, both of Calif., assignors to Public Systems, Inc., Sunnyvale, Calif.

Filed May 20, 1975, Ser. No. 579,166

Int. Cl.² H04B *7/14*

U.S. Cl. 325—4 **10 Claims**



1. In a bidirectional communication system having a first carrier signal source, first transceiver means providing a communication link with said first signal source, second transceiver means for receiving and transmitting signals over a limited range, and an extension unit for establishing a communication link between said first signal source and said second transceiver via said first transceiver, the improvement wherein said extension unit includes punch through means responsive to receipt of a signal from said second transceiver means when said extension unit has established a communication link from said first signal source to said second transceiver via said first transceiver for enabling priority signal transmission from said second transceiver to said first signal source via said first transceiver, said extension unit including a transmitter and a receiver adapted to communicate with said second transceiver, and said punch through means includes sampling means for periodically interrupting transmission to said second transceiver to enable detection of said signal from said second transceiver and means responsive to detection of said last named signal for maintaining said extension unit receiver in the active state and for maintaining said first transceiver means in the transmit mode.

3,955,141
SYNCHRONIZING CIRCUIT FOR MODEMS IN A DATA COMMUNICATIONS NETWORK

David L. Lyon, Cambridge; Jerry L. Holsinger, Burlington, and David E. Williams, Andover, all of Mass., assignors to Intertel, Inc., Burlington, Mass.

Filed Oct. 18, 1974, Ser. No. 515,877

Int. Cl.² H04B *1/00;* H04L *7/00*

U.S. Cl. 325—38 A **10 Claims**

1. A modem for connection between a digital unit and a transmission link, said modem comprising:

A. a transmitter for converting received digital signals from the digital unit into a modulated signal including

i. means for periodically transmitting a framing signal, thereby to establish a transmitted time reference,

ii. means for converting the digital signals to coordinate signals having a first set of values and a second set of values,

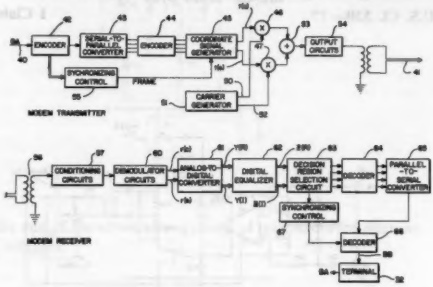
iii. control means for causing said converting means normally to transmit coordinate signals with the first set of values and, in response to a framing signal, to transmit coordinate signals with the second set of values, and

iv. modulator means responsive to the coordinate signals from said converting means for transmitting modulated signals onto the transmission link, and

B. receiver means including

i. means responsive to received modulated signals on the transmission link for producing received coordinate signals corresponding to the transmitted coordinate signals,

ii. means for comparing the received coordinate signals and predetermined signal levels corresponding to boundaries of first and second sets of decision regions, each of the first regions corresponding to a digital value



and having one of the first set of values and each of the second regions corresponding to the second set of coordinate values and having a digital value which duplicates the digital value in one of the first decision regions, said comparison means transmitting a digital value corresponding to the selected decision region, and, when a second of the decision regions is selected, a received framing signal,

iii. synchronization detector means responsive to each received framing signal for establishing a received time reference corresponding to the transmitted time reference, thereby to detect synchronism between the transmitter and receiver operations during a transfer of data, and

iv. means for transmitting to the digital unit digital signals in response to the digital value from said comparison means.

3,955,142

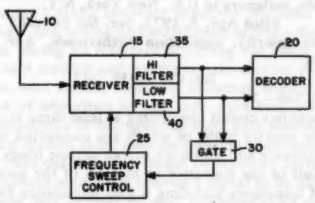
SINGLE-SIDEBAND RADIOTELEPHONE SYSTEM

Vern Richard Frank, Miamisburg; Ronald Eugene Wysong, Centerville, and Michael David Valentine, Cincinnati, all of Ohio, assignors to R. L. Drake Company, Miamisburg, Ohio

Filed Mar. 6, 1975, Ser. No. 556,136

Int. Cl.² H04B 1/68

U.S. Cl. 325—50 **11 Claims**



1. A single-sideband system in which at least part of the information is broadcasted as transitions between two frequencies by a single-sideband transmitter, after the two frequencies are simultaneously broadcast, comprising:

first means for scanning a first range of frequencies and for providing a first output when a signal is sensed,

second means for scanning a second range of frequencies and for providing a second output when a signal is sensed,

gate means, responsive to the simultaneous occurrence of said first and second outputs, for supplying a control signal,

control means, responsive to said control signal, for controlling the scanning frequencies of said first and second means and for halting said frequency scanning in response to said control signal, and

decoder means, responsive to said first and second means, for sensing said transitions between two frequencies.

3,955,143

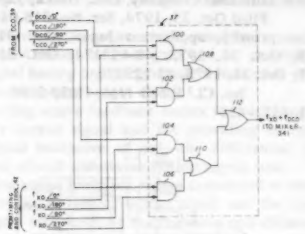
SINGLE SIDEBAND GENERATOR OF BI-LEVEL SIGNALS

John D. Collins, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 346,389, March 30, 1973, Pat. No. 3,879,661, which is a continuation of Ser. No. 229,210, Feb. 1, 1972, abandoned. This application Oct. 9, 1974, Ser. No. 513,667

Int. Cl.² H04B 1/02

U.S. Cl. 325—137 **8 Claims**



1. A single side band generator comprising:

a. means for generating at least two components of a first bi-level signal having a frequency f_A, one of such two components of the first signal being delayed relative to the other one-quarter of its time period;

b. means for generating at least two components of a second bi-level signal having a frequency f_b, one of such two components of the second signal being delayed relative to the other one-quarter of its time period;

c. two logic gates, each one thereof coupled to a different one of the two components of the first signal and a different one of the two components of the second signal;

d. means coupled to each one of the logic gates for combining signals passing therethrough into a composite signal having a dominant frequency $f_A \pm f_B$.

3,955,144

FEEDBACK SYSTEM FOR PULSE TRANSMITTERS

Milton Dishal, Upper Montclair, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Oct. 17, 1974, Ser. No. 515,788

Int. Cl.² H04B 1/04

U.S. Cl. 325—159 **12 Claims**

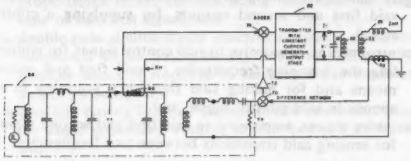
1. An apparatus for obtaining a specified antenna current or voltage waveshape comprising:

an antenna;

a transmitter;

an output network for coupling said transmitter to said antenna;

means for simulating a first voltage having the desired antenna current waveshape, a second voltage having a waveshape equivalent to the waveshape of a voltage which must be produced across the input terminals of said output network in order that said specified antenna current waveshape be produced, and a third voltage which



has a waveshape equivalent to the waveshape of a current which must be injected into the input terminals of said output network in order that said specified waveshape be produced; and

means coupled between said simulating means and said transmitter for driving said transmitter with at least one of said first, second or third voltages.

3,955,145

STATION SELECTOR

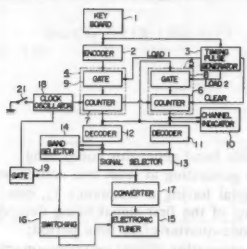
Kazumi Kawashima, Katano, Japan, assignor to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed Oct. 25, 1974, Ser. No. 518,044

Claims priority, application Japan, Oct. 31, 1973, 48-123173; Oct. 31, 1973, 48-123174; Oct. 31, 1973, 48-123175; Oct. 31, 1973, 48-123176

Int. Cl.² H04B *1/16*; H03J *5/00*

U.S. Cl. 325—459 **10 Claims**



1. A station selector comprising an electronic tuner having a voltage variable reactance element serving as a tuning element, a plurality of channel selection voltage preset elements for presetting a plurality of voltages for channel selection before selecting the station, which voltages correspond respectively to a plurality of channel numbers, a channel number entry means for separately providing the channel number digit of the units place and of the tens place, a first binary memory for memorizing the digit of the units place of a given channel number in the form of a corresponding binary signal, a second binary memory for memorizing the digit of the tens place of the channel number in the form of a corresponding binary signal, first and second binary-to-decimal converters for converting the binary contents of said respective first and second binary memories into corresponding decimal signals and providing each of said decimal signals on one of a plurality of output lines for each of said converters, a matrix including a grid of intersecting lines coupled to said output lines of said converters for combining the decimal outputs of both said first and second binary-to-decimal converters such that the combination is made available at one of the intersections of said intersecting lines, a means for taking out outputs from intersecting lines of said one of the intersections, which said one intersection corresponds to a channel number of a channel to be selected, and means for selecting one of said channel selection voltage preset elements corresponding to the output of said means for taking out and coupling the channel selection voltage of said selected element to said voltage variable reactance element.

3,955,146

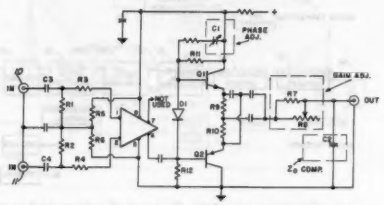
CIRCUIT FOR COUPLING AN ANTENNA TO A LOAD

Richard L. Brennan, Marietta, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 30, 1972, Ser. No. 267,829

Int. Cl.² H03F *3/04*

U.S. Cl. 330—17 **1 Claim**



1. A circuit for coupling a variable impedance source to a constant impedance load comprising:

means, connected to the source, for amplifying a signal from the source, said means including a fixed-gain differential amplifier having emitter feedback;

means, connected between the amplifying means and the load, for presenting a constant impedance output to the load, said output impedance being equal to the impedance of the load,

said constant impedance output means comprising a complementary emitter follower, the latter including a PNP transistor, a NPN transistor and a diode having its anode connected to the base of the NPN transistor and its cathode connected to the base of the PNP transistor; and

means for adjusting the phase of the signal connected between the amplifier and the emitter follower.

3,955,147

AMPLIFIER CIRCUIT

Nicolaas Van Hurck, and Dirk Blom, both of Eindhoven, Netherlands, assignors to U.S., New York, N.Y.

Filed Apr. 3, 1975, Ser. No. 564,843

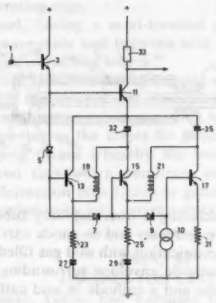
Claims priority, application Netherlands, Apr. 25, 1974, 7405551

Int. Cl.² H03F *3/42*

U.S. Cl. 330—18 **2 Claims**

1. Amplifier circuit comprising at least three transistors the collector emitter paths of which are connected in series for direct currents and which are driven at their bases, the collector circuit of the transistor at the end of the series arrangement of transistors including a load impedance for obtaining an output signal, characterized in that of the transistors other than that the collector circuit of which includes the output impedance the collectors are interconnected for alternating voltages, the emitters are each connected through a resistor to

a fixed potential for alternating voltages and the bases are connected to one another and to the base of the said transistor



at the end of the series arrangement of transistors for alternating voltages.

3,955,148

SAMPLING CIRCUIT

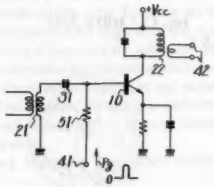
Hideki Miura, Tokyo, and Toshihiro Fujimoto, Ichikawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 25, 1975, Ser. No. 571,690

Claims priority, application Japan, May 9, 1974, 49-52634[U]

Int. Cl.² H03G 3/18

U.S. Cl. 330—29 **3 Claims**



1. A sampling circuit comprising a semiconductor device having a base having a major interface adjoining a collector, an emitter having a major interface adjoining the other major face of said base and having an emitter-base junction therebetween, a gate having an interface adjoining the other major interface of said emitter and having a gate-emitter junction therebetween, said emitter and said collector having a low concentration of impurities of one type, said base and said gate having impurities of the opposite type, said emitter-base junction being spaced from said gate-emitter junction by a distance less than the diffusion length of minority carriers in said emitter, circuit means fpr feeding a signal to be sampled across the base and emitter of said semiconductor device, circuit means connecting an output to the collector of said semiconductor device, and means for applying a gating pulse between the gate and emitter, thereby to increase the amplification characteristic h_{FE} during the gating period.

3,955,149

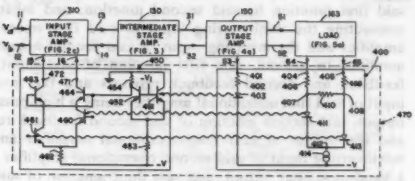
DIFFERENTIAL AMPLIFIER HAVING ACTIVE FEEDBACK CIRCUITRY

Ted R. Trilling, Berkshire Road, R.D. 3, Doylestown, Pa. 18901

Division of Ser. No. 263,505, June 16, 1972, Pat. No. 3,845,404. This application Oct. 23, 1974, Ser. No. 517,118

Int. Cl.² H03F 3/45

U.S. Cl. 330—30 D **6 Claims**



1. A differential amplifier system comprising:

input circuit means adapted to receive an input signal having common mode and differential mode components, and connected to receive common and differential mode feedback signals, and for supplying a first output signal;

output circuit means connected to receive and amplify said first output signal and for providing an output signal having both common mode and differential mode components;

load means having a transducer connected to receive said output circuit means output signal and for providing an output signal having an energy content indicative of said output circuit means output signal;

energy detecting active feedback means for receiving said transducer output signal and for providing an optical output signal indicative of only the differential mode component of said transducer output signal; and

light detecting active feedback means connected to receive said output circuit means output signal and the optical output signal for providing the common and differential mode feedback signals to said input circuit means;

whereby a first feedback loop said light detecting active feedback means and a second feedback loop comprises said load means, said energy detecting active feedback means and said light detecting feedback means.

3,955,150

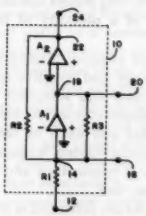
ACTIVE-R FILTER

Michael A. Soderstrand, San Francisco, Calif., assignor to The United States of America as represented by the United States Energy Research & Development Administration, Washington, D.C.

Filed Jan. 15, 1975, Ser. No. 541,177

Int. Cl.² H03F 1/36

U.S. Cl. 330—103 **6 Claims**



1. An active-R filter consisting essentially of first and second operational amplifiers, each amplifier including an inverting input, a noninverting input and an output; means for di-

rectly connecting an input resistor through a first junction to the inverting input of said first operational amplifier; means for directly connecting the output of said first operational amplifier through a second junction to the noninverting inpput of said second operational amplifier; means for directly connecting a first feedback resistor between the inverting input of said first operational amplifier through a third junction to the output of said second operational amplifier; means for directly connecting a second feedback resistor between the inverting input and the output of said first operational amplifier from said first junction to said second junction; and means for connecting the noninverting input of said first operational amplifier and the inverting input of said second operational amplifier to ground, said first junction of said input, first feedback and second feedback resistors and the inverting input of said first operational amplifier being a high-pass filter output, said second junction of said second feedback resistor and the output of said first operational amplifier and the noninverting input of said second operational amplifier being a band-pass filter output, and said third junction of said first feedback resistor and the output of said second operational amplifier being a low-pass filter output.

3,955,151
AMPLIFIER WITH A PLURALITY OF NEGATIVE FEEDBACK CIRCUITS

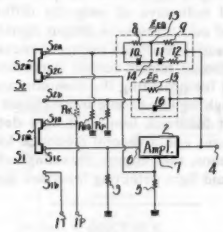
Yoshio Ochiai, Yokosuka, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 18, 1974, Ser. No. 524,958

Claims priority, application Japan, Nov. 24, 1973, 48-135581

Int. Cl.² H03F *1/36*

U.S. Cl. 330—107 **9 Claims**



1. An amplifier with a plurality of negative feedback circuits comprising:

a. an amplifier having an input terminal, a negative feedback terminal and an output terminal, said input terminal having a switching means connected thereto to selectively supply one of a plurality of input signals to the input terminal;

b. a plurality of negative feedback circuits selectively connected between said negative feedback terminal and said output terminal said selection being performed by said switching means connected between said negative feedback terminal and each of said feedback circuits, said switching means having leakage resistance between said input terminal connection and at least one of said feedback circuits; and

c. impedance means provided in at least one of said plurality of negative feedback circuits, each impedance means having a predetermined resistance sufficient to prevent positive feedback oscillation of said amplifier through said switching means leakage resistance when at least one of said feedback circuits is not switched in.

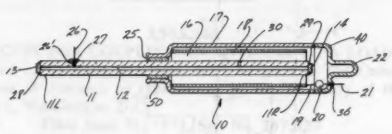
3,955,152
TUBULAR LASER

Albert D. Lewis, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 14, 1975, Ser. No. 550,078

Int. Cl.² H01S *3/03*

U.S. Cl. 331—94.5 D **5 Claims**



1. In a gas laser including a laser capillary tube having a laseable gas filled bore and laser and an anode carried by said laser capillary in communication with said gas filled bore, and miror end pieces, a cathode envelope surrounding an end of said laser capillary tube and a cathode in said cathode envelope, the improvement comprising

an annulus integral with said cathode envelope, said annulus having an internal diameter greater than the external diameter of said laser capillary tube so as to form a cylindrical space between said laser capillary tube and said annulus, and

a low temperature inorganic solder glass sealant filling said cylindrical space and forming a unitary support and seal for said laser capillary tube in said cathode envelope between the ends of said laser capillary tube, whereby one of said laser mirror end pieces is contained in said cathode envelope and the other laser mirror end piece is external of said cathode envelope.

3,955,153
RING LASER FOR PENETRATING WAVES

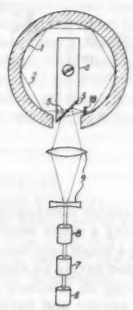
Georges R. P. Marié, 17, rue Croland, 92260 Fontenay-aux-Roses, France

Filed Mar. 17, 1975, Ser. No. 559,154

Claims priority, application France, Mar. 21, 1974, 74.09669

Int. Cl.² H01S *3/08*

U.S. Cl. 331—94.5 C **2 Claims**



1. A ring laser for producing penetrating electromagnetic waves such as x-rays and gamma rays from an active substance comprising:

circular wave guides having a zero electric field intensity along the axis of said wave guides;

pumping beam means comprising a primary light wave or IR laser, for providing a pumping beam having symmetry of revolution for incoming light and millimeter electromagnetic waves about its axis and electric lines of force which

are circles centered on the axis of said beam means which coincides with the axis of said circular wave guides;

a reflecting mirror for reflecting the pumping beam along a line adjacent the center of said mirror to said active substance;

an aperture at the center of said mirror for transmitting said penetrating rays;

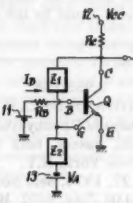
a channel, having a semi-toroidal cross-section, through said waveguide and between said pumping beam means and said reflecting mirror;

said active substance being capable of undergoing thermonuclear fusion upon the absorption of x-rays or gamma rays, said active substance being located in said channel and serving as the target for penetrating rays from said pumping means whereby the incoming light waves or infrared rays which penetrate said aperture undergo transformation into x-rays or gamma rays by absorption and emission by said active substance.

3,955,154
OSCILLATOR CIRCUIT

Tadao Sasaki, Tokyo, and Katsuaki Tsurushima, Kawasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 25, 1975, Ser. No. 571,708
Claims priority, application Japan, May 10, 1974, 49-52119
Int. Cl.² H03B 5/24
U.S. Cl. 331—111 **3 Claims**



1. An oscillator comprising:

a semiconductor device having a first semiconductor region of one conductivity type forming an emitter region;

a second semiconductor region of the opposite conductivity type forming a base region adjacent said first region with a first semiconductor junction therebetween;

a third semiconductor region of the same conductivity type of said first region forming a collector region adjacent said second region with a second semiconductor junction therebetween;

an insulating layer on the outer surface of said emitter region;

a gate electrode on said insulating layer;

said semiconductor device having an emitter grounded amplification characteristic which has a low point with steeply increasing segments extending substantially symmetrically therefrom at both sides thereof in response to changes in voltage between said emitter region and said gate;

a bias potential source for said base region;

a collector potential source connected through a load to said collector region;

a first impedance element connected between said collector region and said gate;

a source of negative bias potential;

a second impedance element connected between said gate and said negative bias source;

an output terminal connected to said collector region;

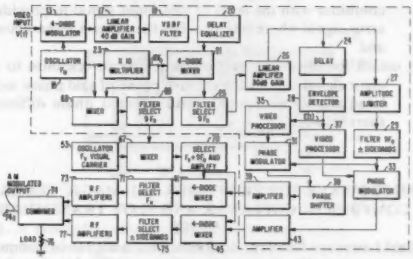
said gate bias voltage being lower than that value which would cause the amplification characteristic to have a minimum value;

the conductive path from said collector region to said gate through said first impedance providing positive feedback thereby establishing current oscillation at said output terminal.

3,955,155
AMPLITUDE MODULATION SYSTEM

William Louis Behrend, Pittsburgh, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 536,003
Int. Cl.² H03C 1/52
U.S. Cl. 332—1 **15 Claims**



1. In combination,

means for amplitude modulating a radio frequency carrier signal with an input signal,

vestigial sideband filtering and delay equalizing means coupled to said modulating means for providing a delay equalized vestigial sideband filtered amplitude modulated signal,

envelope detecting means responsive to said filtered signal for providing an output signal which varies in amplitude according to the envelope of said filtered signal,

amplitude limiter means responsive to said filtered signal for amplitude limiting said delay equalized vestigial sideband filtered amplitude modulated signal,

phase modulating means responsive to said amplitude limited signal and to said output signal of said envelope detecting means to provide a first phase modulated output signal having a phase determined according to the arc cosine of the output signal of said envelope detecting means normalized with unity at the maximum possible level thereof, said phase modulating means providing a second phase modulated output signal having a phase determined according to the - arc cosine of the output signal of said envelope detecting means normalized with unity at the maximum possible level thereof, and

means coupled to said phase modulating means for combining said first and second output signals from said phase modulating means in a manner to provide an amplified, delay equalized vestigial sideband filtered amplitude modulated signal.

12. In a phase to amplitude modulation system of the type wherein a signal is separately phase modulated by two phase modulators and the phase modulated signals are coupled over separate first and second paths to a combiner whose single output is an amplitude modulated signal, an arrangement for controlling the relative amplitude levels of the two phase modulated signals combined at the combiner comprising:

means for deriving a first signal according to the amplitude level of one of said phase modulated signals,

means for comparing said first signal with a reference and for determining the level of said one phase modulated signal according to that comparison,

means for deriving a second signal according to the amplitude level of the other of said phase modulated signals, and

means for comparing said first and second signals and for determining the level of said other phase modulated signal according to said last-mentioned comparison.

14. In a phase to amplitude modulation system of the type wherein an input signal is separately phase modulated by two phase modulators and the phase modulated signals are coupled over separate first and second paths to a combiner whose single output is an amplitude modulated signal, an arrangement for determining the relative phase of said two phase modulated signals to maintain a selected phase difference therebetween at the combining means comprising,

a phase shifter included in one of said paths between the respective one of said phase modulators and said combiner,

means for comparing the signal level at the output of said combiner with the level of said input signal to provide an error signal where one exceeds the other a given amount, and

means for operating said phase shifter in response to said error signal to alter the relative phase of said phase modulated signals to maintain said selected phase difference therebetween.

3,955,156

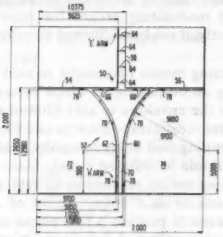
MICROWAVE POWER DIVIDER AND MAGIC TEE EACH COMPRISING COPLANAR AND SLOT TRANSMISSION LINES

Paul Lawrence Fleming, Rockville, Md., assignor to Communications Satellite Corporation (Comsat), Washington, D.C.

Filed Apr. 29, 1974, Ser. No. 465,057

Int. Cl.[2] H01P *5/10, 5/20*

U.S. Cl. 333—9 **5 Claims**



1. A magic tee consisting of a dielectric substrate and film of conductive material covering substantially all of one surface of said substrate, said film having openings therein forming both a slot line series tee having a first input arm and first and second output arms and a coplanar-to-slot line shunt tee having a second input arm and comprising a first portion formed of coplanar transmission line and a second portion formed of two slot line transmission lines, said two slot line transmission lines cooperating with said first and second output arms thereby forming four arms of the magic tee, the openings forming said four arms communicating with one another.

3,955,157

WAVE GUIDE PULSE GENERATOR PRODUCING NARROW WIDTH PULSE

Leonard J. Dvoracek, Burlington, N.C., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,601

Int. Cl.[2] H01P *1/00;* **H03H** *7/14*

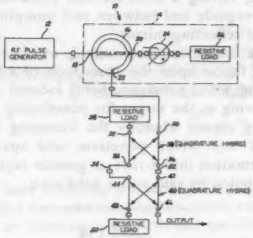
U.S. Cl. 333—20 **11 Claims**

1. A pulse generator for generating an output pulse of a predetermined pulse width comprising:

means for generating a first pulse having a pulse width greater than the output pulse;

means for modifying the first pulse to provide a leading edge of prescribed definition and thereby form a modified first pulse;

wave guide means for generating a second pulse in response to the modified first pulse, so that the second pulse is formed with a leading edge of the prescribed definition, and for phase shifting the second pulse, so that the phase of the second pulse is opposed to the phase of the modified first pulse;



means for delaying the second pulse during a period when the second pulse is being phase shifted to oppose the modified first pulse;

means for combining the delayed opposed phase-shifted second pulse with the modified first pulse so that upon such combining of pulses an output pulse is generated having a pulse width equal to the delay caused by the delaying means.

3,955,158

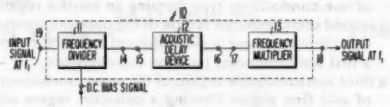
MICROWAVE DELAY LINE

Lakshminarasimha Chainulu Upadhyayula, East Windsor, and Markus Nowogrodzki, Sussex, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1974, Ser. No. 446,418

Int. Cl.[2] H03H *7/44, 9/00;* **H04B** *3/18*

U.S. Cl. 333—29 **6 Claims**



1. A delay line comprising:

a frequency divider means having a semiconductor device exhibiting a negative resistance current-voltage characteristic in response to both a D.C. bias signal and a microwave input signal at frequency f_1 for converting said input signal to an output signal at frequency, f_2, subharmonically related to said frequency f_1;

means for coupling to said semiconductor device a D.C. bias signal having a magnitude less than a critical magnitude, V_T, necessary for operating said semiconductor device;

means for coupling to said semiconductor device said microwave input signal, whereby said semiconductor device converts said input signal to an output signal at frequency f_2, subharmonically related to said frequency f_1;

a delay device for providing a predetermined delay for said frequency divider output signal;

means for coupling said frequency divider circuit to said delay device; and

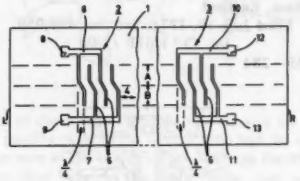
a frequency multiplier means coupled to said delay device for multiplying said frequency, f_2, of said delayed frequency divider output signal from said delay device to said frequency, f_1, of said microwave input signal.

3,955,159

ACOUSTIC SURFACE WAVE DEVICES

Richard Frank Mitchell, Kingston, and Richard Stevens, Copthorne, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 13, 1974, Ser. No. 505,655
Claims priority, application United Kingdom, Sept. 17, 1973, 43483/73
Int. Cl.² H03H 7/38
U.S. Cl. 333—30 R 15 Claims



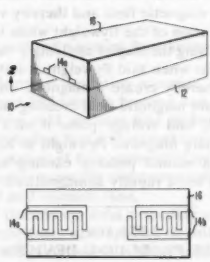
1. An acoustic surface-wave device comprising a wafer of piezoelectric material capable of propagating acoustic surface waves on one surface, launching transducer assembly means coupled to said one surface, receiving transducer means coupled to said one surface, each transducer means including at least one interdigital electrode array, said launching and receiving transducer means being arranged on said one surface whereby, in operation, acoustic surface waves reflected from the ends of the wafer are received in antiphase at the receiving transducer means over one portion of its aperture with respect to end reflected acoustic waves received over a second portion of its aperture thereby to substantially reduce the signal in the receiving transducer means output due to the end reflected acoustic surface waves.

3,955,160

SURFACE ACOUSTIC WAVE DEVICE

Michael Thomas Duffy, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,388
Int. Cl.² H03H 9/26, 9/30, 9/32; H01L 41/18
U.S. Cl. 333—30 R 7 Claims



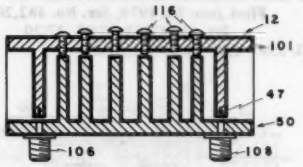
1. A surface acoustic wave device comprising:
a. an insulating substrate selected from the group consisting of sapphire, spinel and BeO;
b. at least two single crystalline electrodes on said substrate; and
c. a single crystalline piezoelectric film on said electrodes.

3,955,161

MOLDED WAVEGUIDE FILTER WITH INTEGRAL TUNING POSTS

William L. MacTurk, Claremont, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Division of Ser. No. 494,693, Aug. 5, 1974, Pat. No. 3,896,545, which is a continuation-in-part of Ser. No. 406,058, Oct. 12, 1973, abandoned. This application Jan. 13, 1975, Ser. No. 540,639
Int. Cl.² H01P 1/20, 3/12, 11/00
U.S. Cl. 333—73 W 2 Claims



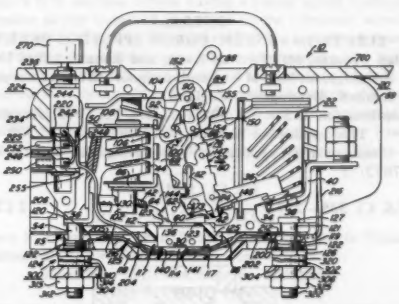
1. A molded plastic waveguide filter comprising:
a plated, molded plastic waveguide filter body, substantially U-shaped, and having integral tuning posts extending therein, said tuning posts being shorter than the walls of said U-shaped waveguide body;
a substantially flat, plated, molded plastic waveguide filter cap disposed over the open end of said U-shaped waveguide filter body and affixed to the walls of said waveguide filter body leaving a gap between the shorter tuning posts and the cap; and
adjustable metal tuning screws extending through said waveguide filter cap into the gap over the tuning posts.

3,955,162

ELECTROMAGNETIC CIRCUIT BREAKER WITH ELECTRICAL AND MECHANICAL TRIP INDICATION

Ronald Nicol, Trenton, N.J., assignor to Heinemann Electric Company, Trenton, N.J.

Division of Ser. No. 384,702, Aug. 1, 1973, Pat. No. 3,863,042. This application Nov. 1, 1974, Ser. No. 519,874
Int. Cl.² H01H 73/12
U.S. Cl. 335—17 7 Claims



1. A circuit breaker comprising a case, stationary and movable contacts within said case, a movable contact arm carrying the movable contact, linkage means for moving said movable arm between open and closed contacts positions,
operating means connected to said linkage means for moving said linkage means,
electromagnetic means for tripping open the contacts on predetermined electrical conditions,
stop means for holding said operating means in a position intermediate its contacts open and closed positions subse-

quent to electrical tripping of the contacts to provide a visual indication of the tripped condition, and

switch means responsive only to the electrical tripping of the contacts to provide an electrical signal indicating the tripped condition of the contacts simultaneously with said visual indication.

3,955,163

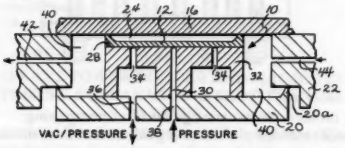
METHOD OF POSITIONING A SEMICONDUCTOR WAFER FOR CONTACT PRINTING

Walter Thomas Novak, San Jose, Calif., assignor to The Computervision Corporation, Bedford, Mass.

Filed June 24, 1974, Ser. No. 482,202

Int. Cl.[2] G03B *27/02, 27/20*

U.S. Cl. 355—132 **10 Claims**



1. Method of positioning a semiconductor wafer with respect to a photomask for photographically contact printing the wafer, said method comprising in sequence the steps of:

1. positioning a semiconductor wafer on a wafer chuck;
2. moving the wafer and chuck into proximity with respect to the photomask with at least a portion of the periphery of the wafer in contact with the photomask;
3. temporarily, physically deforming the wafer to form at least one radially extending portion therein which intersects the portion of the wafer periphery in contact with the photomask, said radially extending deformed portion being positioned further from the photomask than the central portion of the wafer;
4. moving the central portion of the wafer into photographic printing contact with the photomask;
5. terminating said temporary, physical deformation of the wafer; and, thereafter,
6. moving the remaining portion of the wafer into photographic printing contact with the photomask.

3,955,164

ELECTROMAGNETIC FORCE APPLYING DEVICE

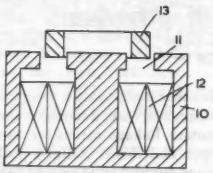
Alan Thomas, Stratford on Avon, and Ronald Alfred Heath, Birmingham, both of England, assignors to Lucas Aerospace Limited, Birmingham, England

Continuation of Ser. No. 406,101, Oct. 12, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,309

Claims priority, application United Kingdom, Oct. 12, 1972, 47073/72

Int. Cl.[2] H01F *7/08*

U.S. Cl. 335—217 **2 Claims**



1. An electromagnetic force applying device comprising a core formed of a first magnetic material and having an annular gap, a winding on the core for producing a substantially radial magnetic field in the gap and an annular armature formed of a second magnetic material and which is drawn into said gap by said field, said armature and said core each being entirely comprised of said first and second magnetic materials, respectively, having respectively different coefficients of thermal expansion.

3,955,165

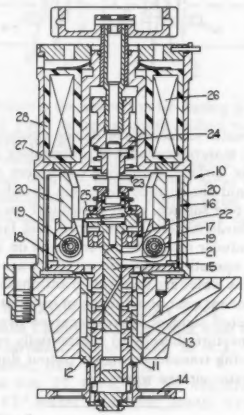
METHOD OF MAGNETISING THE FLYWEIGHTS OF A GOVERNOR

John Stubbs, Liverpool, and James Douglas, Chester, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 19, 1974, Ser. No. 490,059

Int. Cl.[2] H01F *13/00*

U.S. Cl. 335—284 **2 Claims**



1. A method of magnetising or demagnetizing a magnetic flyweight of a centrifugal governor which includes a rotatably mounted flyweight carrier, a magnetic flyweight pivotally mounted on the carrier, means for rotating the carrier to revolve the flyweight in an orbit, said flyweight having a portion on one side of said pivotal mounting effective centrifugally to pivot the flyweight in response to rotation of the carrier, means for creating a magnetic field having a portion passing through said orbit to bias the flyweight toward movement relative to the carrier, and electrical means for varying the intensity of the magnetic field and thereby vary the effective mass of said portion of the flyweight while being pivoted, said method comprising the step of applying a voltage pulse to said electrical means when said flyweight is stationary within said governor to thereby create a magnetic circuit of maximum flux trough said magnetic field creating means and said magnetic flyweight, said voltage pulse if of a first polarity causing said stationary magnetic flyweight to be rapidly magnetized and if of a second polarity causing said stationary magnetic flyweight to be rapidly demagnetized.

3,955,166

PULSE PRODUCING DEVICES

John Howard Moore, Redditch, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Sept. 12, 1974, Ser. No. 505,488

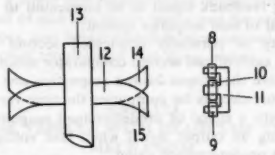
Claims priority, application United Kingdom, Sept. 15, 1973, 43400/73

Int. Cl.[2] H01F *21/04*

U.S. Cl. 336—79 **3 Claims**

1. A pulse producing device comprising in combination an E-shaped bore having thereon an input winding for connec-

tion to an a.c. supply and an output winding, one of said windings being mounted on the central limb of the core and the other winding being formed in two parts on the outer limbs of the core respectively, and a rotatable plate which is formed of a conductive, non-magnetic material and which at its periphery is split and deformed to provide two rows of tags, the tags in one row passing close to the central limb and one of the



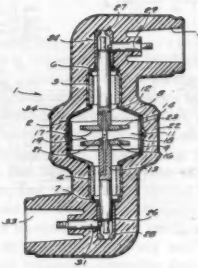
outer limbs of the core as the plate rotates, and the tags in the other row passing close to the central limb and the other outer limb of the core as the plate rotates, the tags thereby modifying the flux flow between the limbs of the core as the plate rotates, when the input winding is connected to said supply, so as to produce an output in the output winding of a nature depending upon the angular position of the plate.

3,955,167

ENCAPSULATED VACUUM FUSE ASSEMBLY

David G. Kumbera, Greendale, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Jan. 8, 1975, Ser. No. 539,419
Int. Cl.² H01H *85/02*
U.S. Cl. 337—188 **7 Claims**



1. An encapsulated vacuum fuse assembly comprising, in combination,

a body of electrical insulating material,

a vacuum fuse including a housing and a fuse element in said housing, said vacuum fuse embedded in said body and also including first and second spaced terminal means for connecting said fuse element in an electrical circuit, said body having generally close engagement over the outer surface of said vacuum fuse,

a coating of flexible material extending over the housing of said vacuum fuse, said coating in intimate engagement with said body and accomodating relative expansion and contraction movement between said vacuum fuse housing and said body due to temperature variations to thereby maintain generally void free engagement therebetween,

and means in said body for providing conductive access to said terminal means for making electrical connections thereto and including fuse adapter means electrically and mechanically connected to said vacuum fuse terminal means and through which current exchange to said vacuum fuse is made,

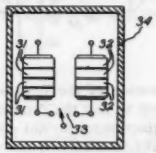
means defining first and second openings in said body open to the fuse assembly ambient, and said fuse adapter means projecting into said openings for accepting external circuit connections.

3,955,168

REJUVENATION METHOD FOR VARISTORS

Lionel M. Levinson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,908
Int. Cl.² H01C *7/13*
U.S. Cl. 338—21 **11 Claims**



1. A method of rejuvenating polycrystalline metal oxide varistors comprising the steps of:

removing a voltage stress from polycrystalline metal oxide varistors whose leakage current performance has been degraded by prolonged exposure to said voltage stress and

heating said varistors in the absence of said voltage stress until said leakage current performance is rejuvenated.

3,955,169

HIGH POWER RESISTOR

Charles S. Kerfoot, Pasadena; Frank A. Halgas, Laurel; Louis A. Razzetti, Severna Park, and Gene A. Di Gennaro, Dundalk, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,369
Int. Cl.² H01C *1/084*
U.S. Cl. 338—51 **3 Claims**

1. A high power resistor for microcircuits comprising:

a planular alumina substrate; a longitudinally extending, thick film resistive means having a planar spiral configuration at one terminus, deposited on the substrate; terminal means affixed to opposite ends of the resistive means; a heat plane base means; means for bonding the base means to the substrate means; heat sink means adapted to conform in one surface dimension to one surface dimension of the base means; means for affixing the conforming surface dimensions of the heat sink means to the base means, and means for lubricating the abutting surfaces.

3,955,170

SOLID STATE SWITCH

Stephen P. Geishecker, Wrentham, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 29, 1974, Ser. No. 528,064
Int. Cl.² H01C *7/04*
U.S. Cl. 338—22 SD **10 Claims**

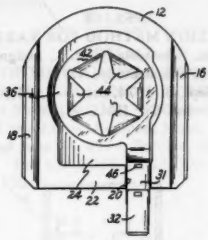
1. A solid state electrical switch comprising:

a disc-shaped element of semiconductive material, the element having first and second opposed generally circular faces;

an electrically conductive coating disposed on each face;

first and second terminal members each including a contact plate having an annular portion, the outer diameter of each annular portion being no longer than the diameter of the circular faces, the contact plate of the first terminal member aligned with and in electrical communication

with the first face and the contact plate of the second terminal member aligned with and in electrical communication with the second face, the annular portion defining a central portion therewithin;



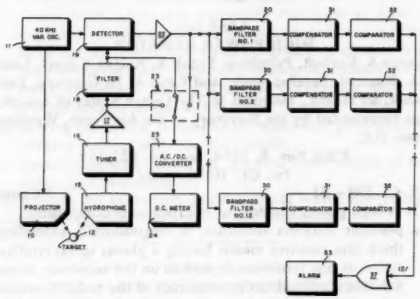
the central portion of the first and second contact plate being formed so that the central portion of the first and second contact plates do not physically engage the conductive coating on the respective faces.

3,955,171

DISCRIMINATING SONIC DETECTION SYSTEM

Alexander E. Skoures, Philadelphia, Pa., and Joseph N. Farace, Maple Shade, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 25, 1970, Ser. No. 75,662
Int. Cl.[2] G01S 9/66; G08B 13/16
U.S. Cl. 340—3 D **4 Claims**



1. A discriminating sonic detection system comprising: projector means for generating an acoustic signal in water; hydrophone means for receiving said acoustic signal modulated by

a doppler frequency signal in said water;

detector means adapted to receive said doppler frequency modulated acoustic signal for providing an output signal having said doppler frequency;

a plurality of parallelly connected bandpass filters connected to receive said doppler frequency, each of said filters passing frequencies in a preselected frequency range to an output;

a plurality of parallelly connected compensator means, each of said compensator means including an amplifier system connected to receive at a first terminal the output from one of said filters and at a second terminal a feedback signal for providing an output signal having an amplitude indicative of the received signals, an a.c./d.c. converter connected to receive the output of said amplifier system for providing a d.c. output level, a first integrator circuit connected to the output of said a.c/d.c. converter for providing an output having a time varying voltage level, a first comparator means connected to receive the output from said first integrator circuit for comparing said time varying voltage level to a predetermined voltage level for providing an output having a polarity indicative of which of said voltage levels has a larger magnitude, a diode connected to the output of said first comparator means for providing conduction of signals of only one polarity to an output, and a second integrator circuit connected to receive the output of said diode for providing a time varying feedback signal to be connected to said second terminal of said amplifier system;

a plurality of parallelly connected second comparator means, each of said second comparator means connected to receive the output from a respective one of said first integrator circuits for comparing the time varying voltage level with a signal of predetermined magnitude and for providing an output signal when said voltage level exceeds a predetermined value;

an OR gate connected to receive the plurality of outputs of said parallelly connected second comparators for providing an output signal upon receiving an output signal from any one of said comparators; and

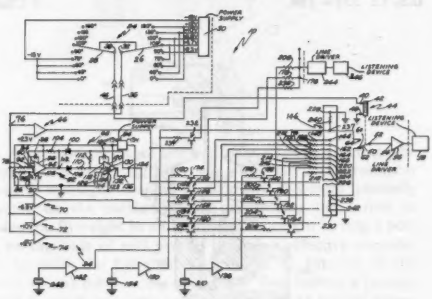
an alarm connected to receive the output signal of said OR gate for indicating an alarm upon receipt of said signal.

3,955,172

REMOTE CONTROL SONAR BEAM STEERER

Ronald T. Rasi, Quaker Hill, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 5, 1975, Ser. No. 555,490
Int. Cl.[2] G01S 3/80
U.S. Cl. 340—6 R **4 Claims**



1. A beam steerer for positioning the listening beam of a sonar linear array having a plurality of hydrophones from a remote point aboard a ship, comprising:

a voltage source generating a plurality of D.C. voltage outputs;

beam selector switching means being in communication with said voltage source;

steering control director means being detachably connected to one of said plurality of voltage outputs of said voltage source via said beam selector switching means, said steering control director means generating a plurality of outputs including one output thereof as an enabling output and the remaining outputs thereof as inhibiting outputs;

an analog switching network including a plurality of switch banks, each one of said plurality of switch banks being connected to a respective hydrophone of said plurality of hydrophones of the linear array and being connected to said control director means;

delay means for providing variable delay at a plurality of terminals thereof to the outputs of said plurality of hydrophones of the linear array, said delay means having the input terminal being connected to said analog switching network;

a line driver means having an input terminal and an output terminal, the input terminal thereof being connected to the output terminal of said delay means and the output terminal thereof being connected to a listening means aboard said ship; and

a Foreward-Aft relay having a first end being connected to said beam selector switching means and a second end thereof being connected to ground and having the fixed end of a wiper arm thereof being connected to the input terminal of said line driver means and the movable end of the wiper arm being detachably connected to the input and output terminals of said delay means.

3,955,173
MOTOR VEHICLE WITH HEADLAMP TILTING MECHANISM

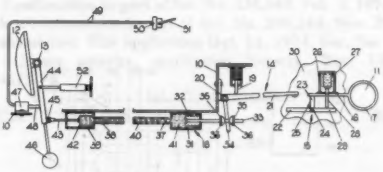
Frederick Raymond Patrick Martin, Bromley, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Mar. 5, 1975, Ser. No. 555,711

Claims priority, application United Kingdom, Mar. 8, 1974, 10454/74

Int. Cl.² B60Q 1/10

U.S. Cl. 240—7.1 LJ **7 Claims**



1. A motor vehicle comprising (1) a body, (2) wheels upon which the body is suspended, (3) headlamps mounted on the body for tilting movement, (4) a mechanism for tilting the headlamp in accordance with changes in the attitude of the vehicle body relative to wheels thereof, said mechanism including a first element pivotally mounted on the body, a second element mounted on an unsprung part of the vehicle, means biasing the first element into engagement with the second element, and transmission means interconnecting the first element and the headlamp whereby movements of the first element are transmitted to the headlamp, and (5) a manually operable device for rendering said tilting mechanism inoperative, said manually operable device being arranged, when operated, to move a portion of the transmission means so as to urge the first element out of engagement with the second element against the action of the biasing means.

3,955,174
DIRECTION INDICATOR SYSTEM FOR ROAD VEHICLES WITH TRAILER ADAPTER MEANS

Andrew Peter Ives, Solihull; Duncan Barry Hodgson, Leamington; Allan Stanley Buckle, Kenilworth, and Raymond Paul Halmshaw, Redditch, all of England, assignors to C.A.V. Limited, Birmingham, England

Continuation of Ser. No. 353,015, April 20, 1973, abandoned. This application Apr. 8, 1974, Ser. No. 458,981

Claims priority, application United Kingdom, Apr. 20, 1972, 18493/72

Int. Cl.² B60Q 1/34

U.S. Cl. 340—73 **11 Claims**

1. A direction indicator system for a vehicle which has at least two direction indicator lamps present respectively on each side of the vehicle, comprising in combination:

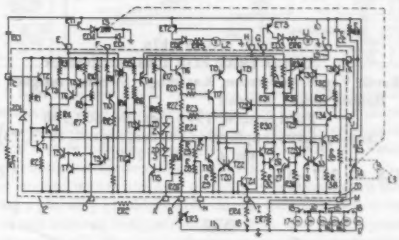
a. first and second supply lines for connection to the vehicle battery,

b. a direction indicator switch having a movable contact with an off position and two operative positions in which the contact is connected to one of the supply lines through the direction indicator lamps on a selected side of the vehicle respectively,

c. a series circuit coupling said movable contact to the other supply line,

d. switching means controlling current flow in said series circuit to provide intermittent current in said series circuit when the contact is in an operative position so that the lamps on the selected side of the vehicle flash,

e. the magnitude of said current being determined by the number of operative indicator lamps on the selected side of the vehicle, and having a first level with one lamp operative, a second and higher level with two lamps operative, and a third and higher level with three lamps operative,



f. a resistance chain connected across said supply lines,

g. a first comparator having one input to a point on said resistance chain and a second input from said series circuit, said first comparator switching from a first state to a second state when the current flow in the series circuit is above said first level,

h. a first output being obtained from said first comparator when said first comparator is in its second state,

i. a second comparator having one input to a different point on said resistance chain and a second input from said series circuit, said second comparator switching from a first state to a second state when the current flow in the series circuit is above said second level,

j. a second output being obtained from said second comparator when said second comparator is in its second state, and

k. pilot lamp means coupled to said comparators for indicating failure of a direction indicator lamp.

3,955,175
DIRECTION INDICATOR CONTROL CIRCUITS FOR ROAD VEHICLES

William David Holt, Colne, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed June 5, 1974, Ser. No. 476,555

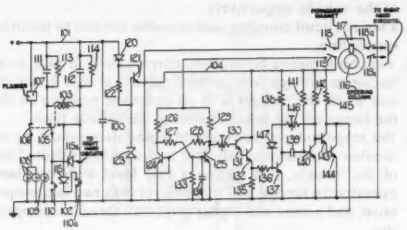
Claims priority, application United Kingdom, July 12, 1973, 33330/73

Int. Cl.² B60Q 1/40, 1/42

U.S. Cl. 340—73 **5 Claims**

1. A direction indicator control circuit for a road vehicle, comprising switch means for operating direction indicator lamps to indicate a turn, a pair of steering wheel actuated switches associated with each turning direction, each said pair being successively actuated in one order when negotiating a turn and in the reverse order at the completion of said turn, a pulse generator operated only by the actuation of said pair of switches in said reverse order resulting from the return

movement of the steering wheel following completion of the indicated turn, said pulse generator when operated producing



a pulse of fixed length, and means operable by the fixed length pulse for cancelling the switch means.

3,955,176

COLD TRAP FOR LASER DIODES

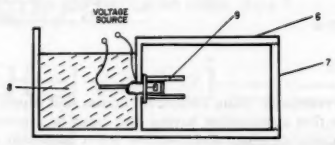
Kenth Yngve Andersson, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Sept. 4, 1974, Ser. No. 503,196

Claims priority, application Sweden, Sept. 4, 1973, 7312001

Int. Cl.² H01L *23/02*

U.S. Cl. 357—81 **5 Claims**



1. Apparatus for use with a light-emitting diode having an anode and a cathode and a light-emitting element and a casing surrounding said light-emitting element and including a light-transparent element, said apparatus comprising in combination:

a holder enclosing said casing,

means for cooling said diode,

and means for preventing the condensation onto the light-transparent element of the cooled diode the water vapour present in said holder, said means comprising a sleeve of high thermal conductivity which tightly contacts and substantially surrounds said casing except for the light transparent element thereof.

3,955,177

MAGNITUDE COMPARISON CIRCUIT

Homer W. Miller, Peoria, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Mar. 26, 1975, Ser. No. 562,318

Int. Cl.² G06F *7/02*

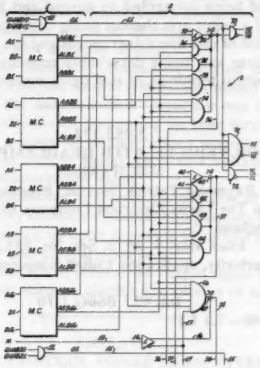
U.S. Cl. 340—146.2 **3 Claims**

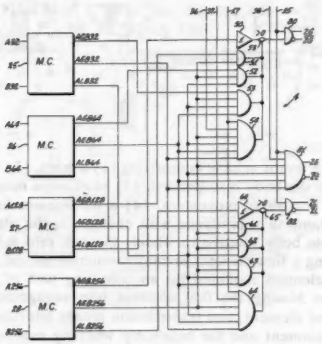
1. A magnitude comparison circuit for comparing two binary numbers of Z bits when a mode signal to which said magnitude comparison circuit is responsive is in a first condition, and for comparing two binary numbers of X bits and two binary numbers of Y bits when said mode signal is in a second condition, where Z is the sum of X and Y, said circuit comprising:

Z comparison means each for comparing two binary bits, one from the corresponding bit position of each of two binary numbers under comparison by said magnitude comparison circuit, and producing an output indicative of the relative magnitudes of such bits;

a first logic network, responsive to the outputs of X of said comparison means, for generating an output indicative of the relative magnitudes of two X-bit binary numbers; and

a second logic network, responsive to the outputs of Y of said comparison means when said mode signal is in said first condition for generating an output indicative of the





relative magnitudes of two Y-bit binary numbers, and responsive to the outputs of Y of said comparison means and the output of said first logic network when said mode signal is in said second condition for generating an output indicative of the relative magnitudes of two Z-bit binary numbers.

3,955,178

SIGNATURE AUTHENTICATION SYSTEM

George H. Warfel, 1305 Hillview Drive, Menlo Park, Calif. 94025

Filed Oct. 9, 1974, Ser. No. 513,428

Int. Cl.² G06K *9/00*

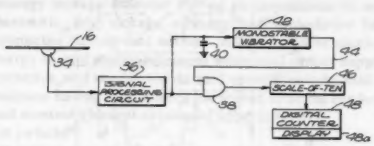
U.S. Cl. 340—146.3 SY **10 Claims**

1. A system for authenticating a signature upon execution as with a writing instrument having a writing tip, comprising:

a tablet means defining a surface for supporting a signature during execution, said tablet surface including discontinuities to form impulses when traversed by the forcefully applied tip of said writing instrument;

electrical means for sensing said impulses to provide an electrical signature signal that is frequency related to the velocity of motion in the execution of said signature;

signal-processing means for receiving said frequency related signature signal to provide a characteristic data signal for characterizing said signature; and



means connected to receive said characteristic data signal to manifest an authenticity characteristic indicative of the authenticity of said signature.

3,955,179

APPARATUS FOR AUTOMATIC PATTERN RECOGNITION AND REGISTRATION OF EMPTY BOTTLES

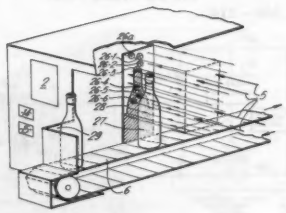
Tore Planke, Nykirke, Norway

Continuation-in-part of Ser. No. 438,968, Feb. 4, 1974, which is a continuation-in-part of Ser. No. 308,244, Nov. 20, 1972, abandoned. This application Oct. 11, 1974, Ser. No. 514,036

Claims priority, application Norway, Dec. 14, 1971, 4613/71

Int. Cl.² G06M 7/00

U.S. Cl. 340—146.3 H **20 Claims**



1. In an apparatus for the automatic pattern recognition of empty bottles by the use of shadow images of the bottles to detect the respective characteristic dimensions of each type of bottle, of the type having an optical device including a light source positioned to direct light to a photo-electric sensing unit, and transport means for transporting bottles across the path of said light; the improvement wherein said sensing unit comprises a plurality of photo-electric sensing devices positioned to detect the occurrence of determined characteristics of a bottle passing across said path of light, said apparatus further comprising a registration device, said registration device comprising programming means for assigning different values to data corresponding to different bottle characteristics, means applying the output of said sensing unit to said registration device for registering therein the number of each type of bottles that pass through said path of light, said means applying the output of said sensing unit to said registration device comprising logic circuit means for passing data corresponding to pre-determined characteristics of bottles, printing means, and control unit means responsive to data registered in said registration device and connected to operate said printing means for printing said data.

3,955,180

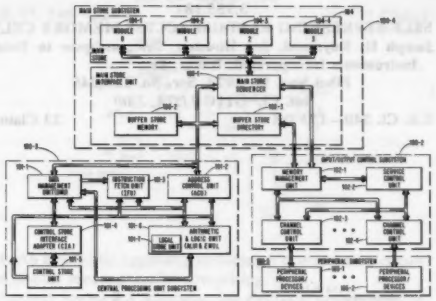
TABLE DRIVEN EMULATION SYSTEM

Allen C. Hirtle, Needham, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 2, 1974, Ser. No. 430,322

Int. Cl.² G05B 17/02, 23/02; G06F 9/19, 11/00

U.S. Cl. 340—172.5 **33 Claims**



1. A host data processing system for processing and executing instructions of a target system program including a plurality of instructions coded in any one of a plurality of formats, said host system including means for operating both in a native and an emulation mode and comprising:

first storage means having a plurality of sections, each having a plurality of addressable storage locations, a first one of said sections being arranged to store said target system program, said program including at least one input/output instruction having an op code character and a plurality of control characters and a second one of said sections having a plurality of tables, each table including a number of entries, each having a predetermined number of bits and corresponding to the number of target system resources of one of a number of different classes not present in said host system and required for executing input-/output instructions specifying different arrangements of programmable configurations of resources included in any one of a number of target systems normally operative to execute said instructions;

a plurality of storage registers coupled to said first storage means for storing predetermined ones of said control characters of said input/output instruction during the execution thereof;

arithmetic and logic means coupled to said plurality of registers;

a control store means including a plurality of microprogram sequences, each sequence including a plurality of microinstructions which upon being decoded generate control signals for controlling the transfer of information bytes between said first storage means, said plurality of registers and said arithmetic and logic means when said host system is conditioned to operate in said emulation mode for emulating the operations of one of said target systems for executing said instructions; and,

branch and testing means for testing the state of signals applied thereto, said means being coupled to said arithmetic and logic means and to said plurality of registers, and to said control store means, said control store means being operative to reference each of said plurality of microprogram sequences in a predetermined sequence for fetching entries in each of said plurality of tables by generating signals for conditioning said arithmetic and logic means to generate address signals using different ones of said control characters stored in said registers and said each sequence generating signals for conditioning said arithmetic and logic means for testing of predetermined bits of corresponding ones of said entries by said branch and testing means to verify the validity and the availability of different ones of said target system re-

sources specified by the coding of said one input/output instruction as required for execution of said instruction by said host system and determine within a minimum of time whether instruction execution is able to take place.

3,955,181

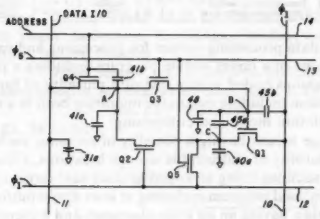
SELF-REFRESHING RANDOM ACCESS MEMORY CELL

Joseph H. Raymond, Jr., Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 19, 1974, Ser. No. 525,245

Int. Cl.² G11C *11/24, 7/00*

U.S. Cl. 340—173 DR **23 Claims**



1. Storage means comprising a first node having capacitance, a second node having capacitance, a third node, an intermittent voltage source, first switching means connecting the voltage source to the third node, second switching means connecting the third node to the first node, the first switching means being controlled by the voltage on the second node, the second switching means being controlled by first recurring clock pulses, a third switching means connecting the first node to the second node, a fourth switching means connecting the third node to a reference potential, the third and fourth switching means being conrolled by second recurring clock pulses out of phase with the first clock pulses.

3,955,182

TRANSISTORISED MEMORY CELL AND AN INTEGRATED MEMORY USING SUCH A CELL

Georges Bert, Paris, France, assignor to Thomson-CSF, Paris, France

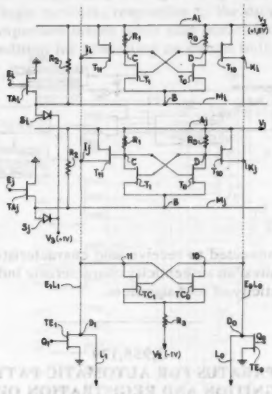
Filed Mar. 21, 1975, Ser. No. 560,864

Claims priority, application France, Mar. 26, 1974, 74.10299

Int. Cl.² G11C *11/40*

U.S. Cl. 340—173 FF **4 Claims**

1. A transistorised memory cell, comprising a first and a second field-effect transistors constituting a logic trigger stage of bistable design with two inputs/outputs and having their sources connected to one and the same word line, a third and a fourth field-effect transistors respectively connected as amplifier-followers, their gates being connected respectively to each of said inputs/outputs, and their sources being connected respectively to a first and a second write-in/read-out line.



3,955,183

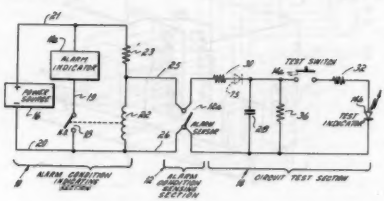
ALARM CONDITION SENSING AND INDICATING CIRCUIT WITH TEST CAPABILITY

John E. McBrian, Bethel, Conn., assignor to The Mosler Safe Company, Hamilton, Ohio

Continuation-in-part of Ser. No. 539,042, Jan. 6, 1975, abandoned. This application Mar. 21, 1975, Ser. No. 560,051

Int. Cl.² G08B *19/00*

U.S. Cl. 340—214 **17 Claims**



1. An alarm condition responsive and indicating circuit testable to determine the operability thereof, comprising:

a power supply,

an alarm indicator connected to said power supply,

a first electrical switch connected in circuit with said power supply and alarm indicator, said first switch having activated and deactivated states for controlling the energization of said alarm indicator by said power supply, said first switch when activated placing said alarm indicator in a predetermined energization state to provide an alarm indication,

an electrical control element connected to said power supply and having relatively conductive and nonconductive states, said control element controlling said first electrical switch to activate it and produce said alarm indication when said control element is rendered in its relatively nonconductive state and to deactivate said first switch when said control element is rendered in its relatively conductive state,

a second switch responsive to alarm conditions connected to electrically shunt said control element when said second switch is placed in an electrically conductive state in response to sensing an alarm condition, whereby said electrically shunted control element is placed in its rela-

tively nonconductive state to activate said first switch and produce said alarm indication, said second switch normally being in a nonconductive state in the absence of an alarm condition to place said control element in its relatively conductive state and deactivate said first switch,

an energy storage element having an impedance in series therewith, said storage element and impedance being connected across said second switch to store electrical energy in said storage element when said power supply is operative and connected to said second switch, said impedance having a resistance sufficient to avoid rendering said control element relatively nonconductive,

a test switch,

a test indicator connected in series with said test switch,

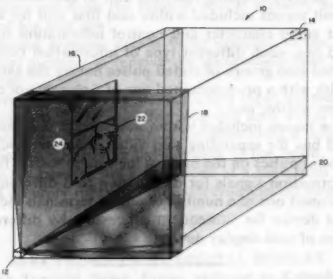
said test switch and test indicator being connected in circuit with said storage element to energize said test indicator with energy stored in said storage element when said test switch is activated, thereby providing an indication that said power supply is operative and connected to said second switch.

3,955,184

PASSIVE INFRARED ROOM INTRUSION DETECTOR

Robert J. Cinzori, Santa Barbara, and Daniel R. Ledbetter, Goleta, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 18, 1975, Ser. No. 605,495
Int. Cl.² G08B *13/18*
U.S. Cl. 340—258 B **3 Claims**



1. A system for monitoring entry through any one of a plurality of planar surfaces of a room, which system includes

a. one or more means for optically reflecting or refracting to a predetermined location any changes in radiation received from a plurality of polyhedrons, each having a plane adjacent a separate one of said surfaces,

b. a detection means at said location optically coupled to said reflecting or refracting means for generating a low level - low frequency signal voltage in response to radiation changes received from said polyhedrons, and

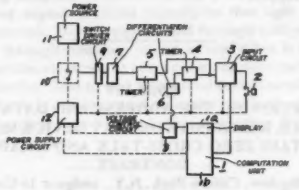
c. signal processing means coupled to said detection means for converting and amplifying said low level - low frequency signal voltage so as to be useful as an alarm signal indicating surreptitious entry through one of said surfaces.

3,955,185

POWER SUPPLY FOR CALCULATORS

Kousuke Nishimura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 29, 1973, Ser. No. 420,062
Claims priority, application Japan, Nov. 29, 1972, 47-119705
Int. Cl.² G08B *5/36*
U.S. Cl. 340—324 R **7 Claims**



1. An electronic apparatus including a computation circuit and display means therefor comprising:

a power source for activating the electrical components of said computation circuit and said display means;

first timer means for decreasing the amount of power supplied to said display means by a predetermined amount after the lapse of a first predetirmined time period; and

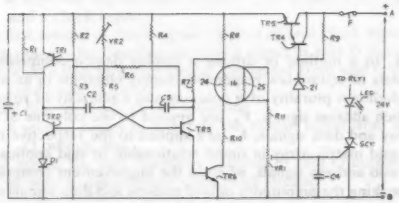
second timer means for precluding the application of power from said power supply to both said electrical components and said display means after the lapse of a second predetermined time period.

3,955,186

SAFETY SYSTEMS FOR MINIMIZING FIRE AND EXPLOSION HAZARDS IN THE PRESENCE OF COMBUSTIBLE GASES

John Llewellyn Green, Old Harlow, and Alan Frank Notschild, Harlow, both of England, assignors to Greenpar Heat Treatments Limited, Harlow, England

Filed Oct. 7, 1974, Ser. No. 512,961
Int. Cl.² G08B *17/10*
U.S. Cl. 340—237 R **10 Claims**



1. A safety system for the detection of low concentrations of combustible gases which operate to turn off a fuel supply on detection of a combustible gas including: remote controlled valve means in the main supply of the fuel for turning said fuel supply on and off; a solenoid for controlling said valve means; means for energizing said solenoid; a transducer positioned to detect the presence of a combustible gas, said transducer having first and second elements; an astable multivibrator having an off/on mark space ratio of approximately 50:1 for supplying low voltage short duration pulses to the first element of the transducer; a low voltage D.C. source for energizing both the solenoid and the astable multivibrator; a solid state element having a control electrode, said element being connected across the low voltage

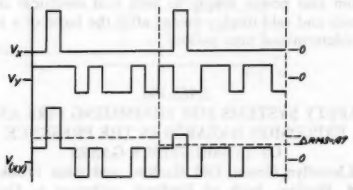
D.C. supply; a resistive circuit in series with the circuit across the elements of the transducer; means for connecting the control electrode of the solid state element to an appropriate point on the resistive circuit so that said solid state element will be caused to conduct when current flows in the resistive circuit due to the presence of gas; and relay means operable from the conduction of the solid state element for cutting off the supply to the solenoid and hence turning off the fuel supply.

3,955,187

PROPORTIONING THE ADDRESS AND DATA SIGNALS IN A R.M.S. RESPONSIVE DISPLAY DEVICE MATRIX TO OBTAIN ZERO CROSS-TALK AND MAXIMUM CONTRAST

John E. Bigelow, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,969
Int. Cl.[2] G02F *1/18*
U.S. Cl. 340—324 M 5 Claims



1. In a method of driving a display device comprising a matrix of square-law responsive display elements in an array including a plurality of n columns and a plurality of rows, in which address signals, V_x, are applied to the columns of said array and data signals, V_y, are applied to the respective rows of said matrix array in timed relationship to said application of said address signals, wherein the improvement comprises:

making the amplitudes of said address and data signals such that their ratio is defined by:

$$\frac{V_x}{V_y} = \sqrt{n},$$

so that the ratio, R, of the root mean square amplitude of the total signal V_{on} applied to display elements intended to be on and the root mean square amplitude of the total signal, V_{off}, applied to display elements intended to be off is given substantially by:

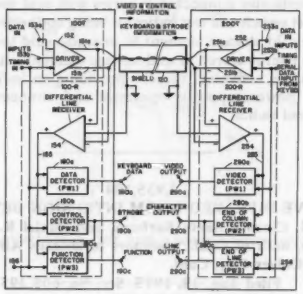
$$R = 1 + 1/\sqrt{n}$$

3,955,188

ENCODING TECHNIQUE FOR ENABLING A DEVICE TO PROCESS DIFFERENT TYPES OF DIGITAL INFORMATION TRANSMITTED ALONG A SINGLE INFORMATION CHANNEL

G. R. Viswanathan, Troy, N.Y., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Division of Ser. No. 103,409, Jan. 4, 1971. This application Apr. 8, 1974, Ser. No. 458,145
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 AD 13 Claims



1. In a display system including a first unit for transmitting digital information including video character and control information signals to a second unit for use in a cathode ray tube display device, an interconnection system comprising:

a bus directly coupling said first unit to said second unit;

transmit means included within said first unit for applying said video character and control information signals to said bus, each different type of information being pulse coded into groups of coded pulses having the same pulse width with a predetermined one of a plurality of different pulse widths; and,

receive means included within said second unit coupled to said bus for separating said video characters pulses and control pulses on the basis of their pulse widths from said information signals for distribution to a different predetermined one of a number of output terminals included in said device for subsequent processing by different portions of said display device.

3,955,189

DATA DISPLAY TERMINAL HAVING DATA STORAGE AND TRANSFER APPARATUS EMPLOYING MATRIX NOTATION ADDRESSING

Douglas H. Thomson, Orange, Calif., assignor to Lear Siegler, Santa Monica, Calif.

Filed July 24, 1974, Ser. No. 491,279
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 AD 3 Claims

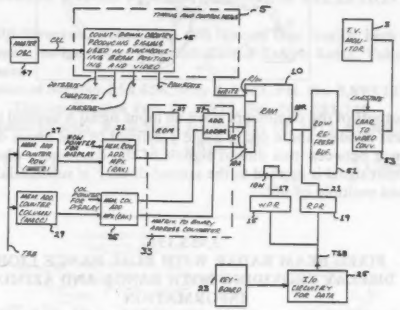
1. In a data display terminal having a television monitor in which a beam is deflected in position to sweep in a pattern of raster lines and is intensity modulated so that a first plurality of the raster lines provide for displaying a page of characters arranged in rows and columns, and a second plurality of raster lines provide blank spaces between rows, the combination comprising:

first memory means comprising a random-access memory having a plurality of locations each addressable by an absolute binary address, the locations for respectively storing multi-bit data words encoded to represent characters, the first memory means having storage capacity sufficient to store each of the data words for a full page;

second memory means having storage capacity sufficient to store each of the data words for a full row;

counting address register means associated with the random access memory and providing for the storage of address pointers that are represented in matrix notation including a row component and a column component, the counting address register means including separate counting registers for the row and column components with the column component counting register operable to count cyclically through a total number of counts that is not a power of two;

address converter circuit means, coupled between the counting address register means and the random access memory and including address adder circuit means, for



converting each such address pointer to an absolute binary address for the random access memory;

means responsive to sequentially converted pointers each containing the same row component for sequentially reading out from the random access memory each data word for that row;

the second memory means being coupled to the random access memory to receive the sequentially read out data words;

converter circuit means having a first input coupled to the second memory means for receiving data words one at a time, and having an output for generating a serial-by-bit signal for controlling the intensity of the beam; and

means for transferring a data word at a time from the second memory means to the converter circuit means.

3,955,190

ELECTRO-OPTICAL DIGITAL DISPLAY

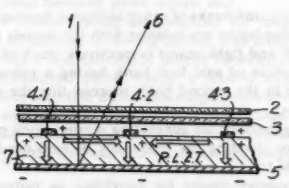
Katsuhiro Teraishi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sept. 11, 1973, Ser. No. 396,341

Claims priority, application Japan, Sept. 11, 1972, 47-90352

Int. Cl.² G06F 3/14

U.S. Cl. 340—336 **7 Claims**



1. An electro-optical digital display assembly comprising a transparent ceramic material formed as a plate having a pair of opposed major surfaces, a first major surface of said plate including a first transparent electrode affixed thereto, a second major surface of said plate including a second light reflective electrode affixed thereto, said first transparent electrode being segmented to define selected regions of said ceramic plate therebetween, circular polarization means including a polarization plate overlying said transparent electrode, and circuit means respectively coupled to said first transparent electrode and said second reflective electrode, said circuit means being adapted to selectively apply an electric field to said selective regions defined thereby so that light incident upon said ceramic plate having passed through said polarizing means and through selecting region of said plate is reflected by said reflective electrode in response to the selected application of an electric field to said segmented reflective electrodes at said selected regions, said selected regions remaining opaque to incident light in the absence of electric fields selectively applied thereto.

3,955,191

ANALOG-TO-DIGITAL CONVERTER

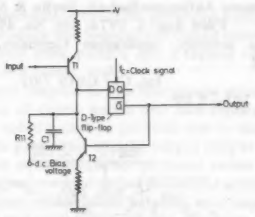
Edward Harry Lambourn, Enfield, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,111

Claims priority, application United Kingdom, Mar. 5, 1974, 09770/74

Int. Cl.² H03K 13/20

U.S. Cl. 340—347 NT **14 Claims**



1. An analog-to-digital converter of the pulse density code type comprising;

a D-type flip flop having a D input, a Q output, a Q output and a clock input;

a first source of clock signal coupled to said clock input;

first means for coupling an analog signal to said D input;

at least a first feedback circuit connected from said Q output to said D input;

said first feedback circuit including

a second means to integrate the output signal from said Q output; and

an output for said converter coupled to said Q output to provide a pulse density code pulse stream.

3,955,192

STORM SEVERITY MONITORING SYSTEM

Fairis S. Burt, 1139 Airport Road, Hot Springs, Ark. 71901

Filed Dec. 23, 1974, Ser. No. 535,396

Int. Cl.³ G08B 21/00

U.S. Cl. 340—421 **4 Claims**

4. In a storm severity monitoring system which includes a direct current source of energy impressed upon a serial arrangement of an SCR and an alarm audibly responsive to variations of current therein, the improvement comprising:

an iron-cored electromagnetic coil;

an audio frequency amplifier having input, output, and positive and negative terminals;

means directly electrically connecting (1) said coil to the input terminals of said amplifier, (2) the positive terminal of said source to the positive terminal of said amplifier,

D.C. supply; a resistive circuit in series with the circuit across the elements of the transducer; means for connecting the control electrode of the solid state element to an appropriate point on the resistive circuit so that said solid state element will be caused to conduct when current flows in the resistive circuit due to the presence of gas; and relay means operable from the conduction of the solid state element for cutting off the supply to the solenoid and hence turning off the fuel supply.

3,955,187

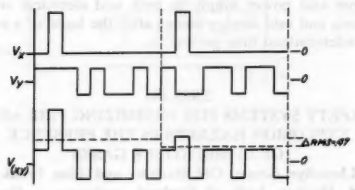
PROPORTIONING THE ADDRESS AND DATA SIGNALS IN A R.M.S. RESPONSIVE DISPLAY DEVICE MATRIX TO OBTAIN ZERO CROSS-TALK AND MAXIMUM CONTRAST

John E. Bigelow, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,969

Int. Cl.[2] G02F 1/18

U.S. Cl. 340—324 M **5 Claims**



1. In a method of driving a display device comprising a matrix of square-law responsive display elements in an array including a plurality of n columns and a plurality of rows, in which address signals, V_x, are applied to the columns of said array and data signals, V_y, are applied to the respective rows of said matrix array in timed relationship to said application of said address signals, wherein the improvement comprises:

making the amplitudes of said address and data signals such that their ratio is defined by:

$$\frac{V_x}{V_y} = \sqrt{n} ,$$

so that the ratio, R, of the root mean square amplitude of the total signal V_{on} applied to display elements intended to be on and the root mean square amplitude of the total signal, V_{off}, applied to display elements intended to be off is given substantially by:

$$R = 1 + 1/\sqrt{n}$$

3,955,188

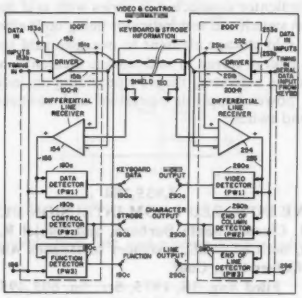
ENCODING TECHNIQUE FOR ENABLING A DEVICE TO PROCESS DIFFERENT TYPES OF DIGITAL INFORMATION TRANSMITTED ALONG A SINGLE INFORMATION CHANNEL

G. R. Viswanathan, Troy, N.Y., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Division of Ser. No. 103,409, Jan. 4, 1971. This application Apr. 8, 1974, Ser. No. 458,145

Int. Cl.[2] G06F 3/14

U.S. Cl. 340—324 AD **13 Claims**



1. In a display system including a first unit for transmitting digital information including video character and control information signals to a second unit for use in a cathode ray tube display device, an interconnection system comprising:

a bus directly coupling said first unit to said second unit;

transmit means included within said first unit for applying said video character and control information signals to said bus, each different type of information being pulse coded into groups of coded pulses having the same pulse width with a predetermined one of a plurality of different pulse widths; and,

receive means included within said second unit coupled to said bus for separating said video characters pulses and control pulses on the basis of their pulse widths from said information signals for distribution to a different predetermined one of a number of output terminals included in said device for subsequent processing by different portions of said display device.

3,955,189

DATA DISPLAY TERMINAL HAVING DATA STORAGE AND TRANSFER APPARATUS EMPLOYING MATRIX NOTATION ADDRESSING

Douglas H. Thomson, Orange, Calif., assignor to Lear Siegler, Santa Monica, Calif.

Filed July 24, 1974, Ser. No. 491,279

Int. Cl.[2] G06F 3/14

U.S. Cl. 340—324 AD **3 Claims**

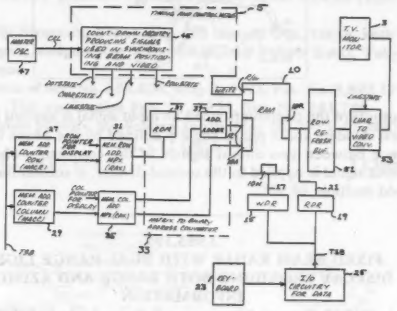
1. In a data display terminal having a television monitor in which a beam is deflected in position to sweep in a pattern of raster lines and is intensity modulated so that a first plurality of the raster lines provide for displaying a page of characters arranged in rows and columns, and a second plurality of raster lines provide blank spaces between rows, the combination comprising:

first memory means comprising a random-access memory having a plurality of locations each addressable by an absolute binary address, the locations for respectively storing multi-bit data words encoded to represent characters, the first memory means having storage capacity sufficient to store each of the data words for a full page;

second memory means having storage capacity sufficient to store each of the data words for a full row;

counting address register means associated with the random access memory and providing for the storage of address pointers that are represented in matrix notation including a row component and a column component, the counting address register means including separate counting registers for the row and column components with the column component counting register operable to count cyclically through a total number of counts that is not a power of two;

address converter circuit means, coupled between the counting address register means and the random access memory and including address adder circuit means, for



converting each such address pointer to an absolute binary address for the random access memory;

means responsive to sequentially converted pointers each containing the same row component for sequentially reading out from the random access memory each data word for that row;

the second memory means being coupled to the random access memory to receive the sequentially read out data words;

converter circuit means having a first input coupled to the second memory means for receiving data words one at a time, and having an output for generating a serial-by-bit signal for controlling the intensity of the beam; and

means for transferring a data word at a time from the second memory means to the converter circuit means.

3,955,190

ELECTRO-OPTICAL DIGITAL DISPLAY

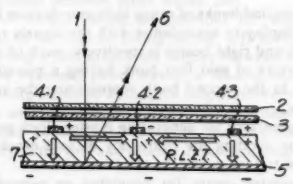
Katsuhiro Teraishi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sept. 11, 1973, Ser. No. 396,341

Claims priority, application Japan, Sept. 11, 1972, 47-90352

Int. Cl.² G06F 3/14

U.S. Cl. 340—336 **7 Claims**



1. An electro-optical digital display assembly comprising a transparent ceramic material formed as a plate having a pair of opposed major surfaces, a first major surface of said plate including a first transparent electrode affixed thereto, a second major surface of said plate including a second light reflective electrode affixed thereto, said first transparent electrode being segmented to define selected regions of said ceramic plate therebetween, circular polarization means including a polarization plate overlying said transparent electrode, and circuit means respectively coupled to said first transparent electrode and said second reflective electrode, said circuit means being adapted to selectively apply an electric field to said selective regions defined thereby so that light incident upon said ceramic plate having passed through said polarizing means and through selecting region of said plate is reflected by said reflective electrode in response to the selected application of an electric field to said segmented reflective electrodes at said selected regions, said selected regions remaining opaque to incident light in the absence of electric fields selectively applied thereto.

3,955,191

ANALOG-TO-DIGITAL CONVERTER

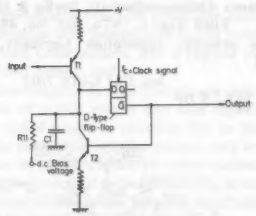
Edward Harry Lambourn, Enfield, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,111

Claims priority, application United Kingdom, Mar. 5, 1974, 09770/74

Int. Cl.² H03K 13/20

U.S. Cl. 340—347 NT **14 Claims**



1. An analog-to-digital converter of the pulse density code type comprising;

a D-type flip flop having a D input, a Q output, a Q output and a clock input;

a first source of clock signal coupled to said clock input;

first means for coupling an analog signal to said D input;

at least a first feedback circuit connected from said Q output to said D input;

said first feedback circuit including

a second means to integrate the output signal from said Q output; and

an output for said converter coupled to said Q output to provide a pulse density code pulse stream.

3,955,192

STORM SEVERITY MONITORING SYSTEM

Fairis S. Burt, 1139 Airport Road, Hot Springs, Ark. 71901

Filed Dec. 23, 1974, Ser. No. 535,396

Int. Cl.² G08B 21/00

U.S. Cl. 340—421 **4 Claims**

4. In a storm severity monitoring system which includes a direct current source of energy impressed upon a serial arrangement of an SCR and an alarm audibly responsive to variations of current therein, the improvement comprising:

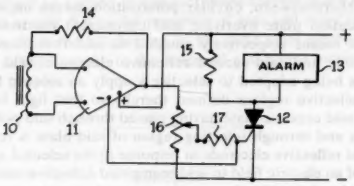
an iron-cored electromagnetic coil;

an audio frequency amplifier having input, output, and positive and negative terminals;

means directly electrically connecting (1) said coil to the input terminals of said amplifier, (2) the positive terminal of said source to the positive terminal of said amplifier,

and (3) the negative terminal of said amplifier to the gate of said SCR;

a potentiometer including a wiper contact;



means directly electrically connecting one terminal of the potentiometer to the negative terminal of said source and the other terminal to the output terminal of said amplifier; and

means including a resistance element electrically connecting said wiper contact to the gate of said SCR.

3,955,193

METHOD OF DIGITALLY FILTERING SIGNALS WITH SUBSTANTIALLY DIFFERING SIGNAL LEVELS AND APPARATUS THEREFOR

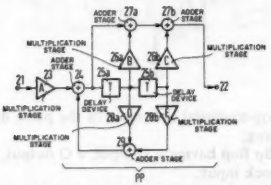
Hans Koffler, Rheinbach; Heinz Kraus, Puchheim-Bahnof, and Wolfgang Koethmann, Feldafing, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 1, 1974, Ser. No. 493,860

Claims priority, application Germany, Aug. 1, 1973, 2338992

Int. Cl.² G01S 7/02

U.S. Cl. 343—5 DP **18 Claims**



11. A method according to claim **1**, for use in radar devices, comprising determining the ratio value from a predicted future signal course determined by a computer from the previous signal course.

3,955,194

MICROWAVE HYBRID NETWORK PRODUCING DESIRED PHASE DIFFERENCE FOR USE IN DOPPLER RADAR SYSTEMS

Lye-Whatt Chua, Salfords, near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

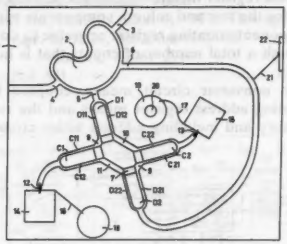
Filed Nov. 6, 1974, Ser. No. 521,261

Claims priority, application United Kingdom, Nov. 8, 1973, 51875/73

Int. Cl.² G01S 9/44; H01P 5/12, 5/22

U.S. Cl. 343—8 **13 Claims**

1. A microwave transmission-line circuit comprising a hybrid junction and four split-tee junctions, two of the split-tee junctions constituting power dividers and the other two constituting power combiners, wherein the inputs of the two dividers are respectively connected to two ports of the hybrid junction, wherein first outputs of the first and of the second of the dividers are respectively connected to first inputs of the first and of the second of the combiners, wherein the second outputs of the first and of the second dividers are respectively connected to the second inputs of the second and of the first combiners, and wherein the differences in lengths of the interconnections of the split-tee junctions are such that the net difference between, a phase angle x defined by the difference in phase between two signals appearing respectively at the



outputs of the combiners when an input signal is applied to the first divider, and a phase angle y defined by the phase difference between two output signals of the combiners when an input signal is applied to the second divider, is substantially an odd multiple of 90°.

3,955,195

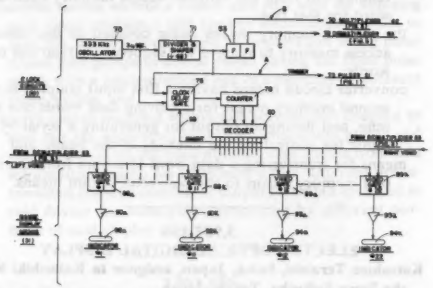
FIXED BEAM RADAR WITH DUAL RANGE LIGHT DISPLAY PROVIDING BOTH RANGE AND AZIMUTH INFORMATION

Leonard M. Greene, Chappaqua, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 471,349, May 17, 1974. This application Oct. 23, 1974, Ser. No. 517,164

Int. Cl.² G01S 7/04, 9/04

U.S. Cl. 343—13 R **9 Claims**



1. In a radar system having transmitter means for generating pulses of radio frequency energy, antenna means for radiating a beam of said energy and for receiving echoes from objects in the path of the radiated beam in a pair of lobes to the left and right of the antenna boresight, and means for converting the received echoes to video signals, the improvement comprising:

first and second banks of range indicator devices for providing a display in accordance with the signals received in the left and right beams respectively, each of the indicator devices of said first bank having a paired indicator device in the second bank representing the same range thereas,

a clock generator for generating master clock pulses,

means for dividing the frequency of said clock pulses to provide trigger pulses for the transmitter,

digital counter means for providing an output count in response to said clock pulses, the count of said counter means being initiated in response to said trigger pulses,

decoder means responsive to the output of said counter means for producing a sequence of pulses which are time

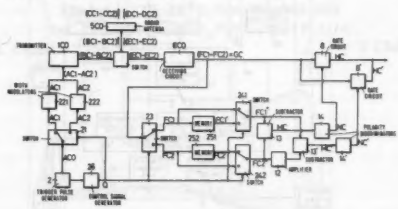
related to the trigger pulses so as to each represent a predetermined radar range, first and second groups of gating means for the range indicator devices in the first and second groups thereof respectively, the gating means in said first and second groups receiving the video signals representing signals received in said left and right beams respectively and each being gated in response to a separate one of the decoder means pulses, and

means for coupling a signal in accordance with the output of each of said gating means to an associated one of said indicator devices.

3,955,196
MARINE RADAR TRANSMISSION AND RECEPTION SYSTEM

Tomiji Nirasawa, Yokohama, and Hiroshi Ota, Tokyo, both of Japan, assignors to Kabushikikaisha Tokyo Keiki, Tokyo, Japan

Division of Ser. No. 358,456, May 8, 1973, Pat. No. 3,893,117. This application Feb. 21, 1975, Ser. No. 551,740
Claims priority, application Japan, May 10, 1972, 47-46033
Int. Cl.² G01S 9/06
U.S. Cl. 343—17.1 R **2 Claims**



1. A marine radar transmission and reception system comprising:

a. means for sequentially generating first and second transmission pulse radar waves of first and second pulse widths, respectively;

b. an antenna for sequentially emitting the first and second transmission pulse radar waves in the same direction as first and second emitted pulse radar waves respectively and sequentially receiving first and second reflected pulse radar waves of the first and second emitted pulse radar waves;

c. a receiving circuit supplied with the output of the antenna;

d. means for producing first and second received pulse waves corresponding to the first and second reflected pulse radar waves from the output of the receiving circuit, respectively;

e. a parallel circuit of first and second gate circuits gating the output of the receiving circuit or either one of the first and second received pulse waves; and

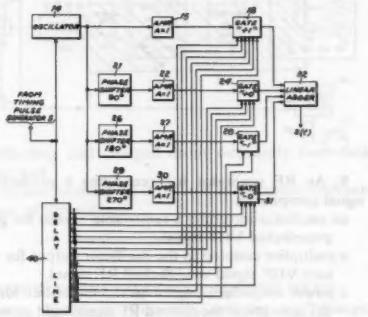
f. control means having an amplifier for amplifying the output of the first receiving circuit, a first subtractor for producing a first difference output between the first and second received pulse waves, a second subtractor for producing a second difference output between the output of the amplifier and the second received pulse wave, and first and second discriminators for discriminating the polarity of the first and second difference outputs, respectively;

g. in which the first and second gate circuits are controlled with outputs of the first and second discriminators of the control means, respectively, whereby sea clutter eliminated received pulse waves are obtained from the parallel circuit.

3,955,197
IMPULSE CORRELATION FUNCTION GENERATOR

Frank S. Gutleber, Wayne, N.J., and Robert S. Bailey, Concord, Mass., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 3, 1966, Ser. No. 518,401
Int. Cl.² G01S 9/233
U.S. Cl. 343—17.2 PC **10 Claims**



1. An impulse correlation function generator comprising:

first means to produce one sequence of coded pulses having a predetermined code pattern and a replica of said sequence of coded pulses; and

correlation means coupled to said first means responsive to said sequence of coded pulses and said replica of said sequence of coded pulses to produce due to said predetermined code pattern an impulse output only at the time of coincidence of said sequence of coded pulses and said replica of said sequence of coded pulses and a zero output at all other time relationships between said sequence of coded pulses and said replica of said sequence of coded pulses;

said first means including

a source of signal having a given frequency and phase,

second means coupled to said source to phase shift said signal a first predetermined amount,

a third means coupled to said source to phase shift said signal a second predetermined amount different than said first amount,

fourth means coupled to said source to phase shift said signal a third predetermined amount different than said first and second amounts,

a first gate means coupled to said source,

a second gate means coupled to said second means,

a third gate means coupled to said third means,

fourth gate means coupled to said fourth means,

fifth means coupled in a predetermined manner to said first, second, third and fourth gate means to control the conduction thereof at different times in accordance with said predetermined code pattern,

sixth means coupled to the output of said first, second, third and fourth gate means to provide said sequence of coded pulses;

seventh means coupled to said sixth means for radiantly transmitting said sequence of coded pulses to a remote point,

eighth means to couple the output of said sixth means to said correlation means,

ninth means for receiving said sequence of coded pulses from said remote point to produce said replica of said sequence of coded pulses, and

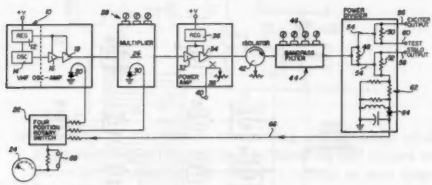
tenth means to couple the output of said ninth means to said correlation means.

3,955,198

RADAR RF GENERATOR INCLUDING A STABLE LOCAL OSCILLATOR AND AN EXCITER CIRCUIT

Dennis Richard Delzer, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 427,900
Int. Cl.[2] G01S 7/42; H03K 1/17
U.S. Cl. 343—17.7 11 Claims



9. An RF generator for generating a predetermined RF signal comprising:

an oscillator including a removable crystal for generating a preselected VHF signal,

a multiplier coupled to the oscillator output for multiplying said VHF signal to a desired RF signal,

a power amplifier coupled to the multiplier for enhancing the strength of the desired RF signal, said power amplifier including a tuning means for fine tuning the desired RF signal,

a tunable bandpass filter for selecting a desired bandpass signal from said RF signal and attenuating the nonselected signal,

a power divider coupled to the tunable bandpass filter for dividing the selected bandpass signal into a plurality of selected signals including a signal for an exciter, and

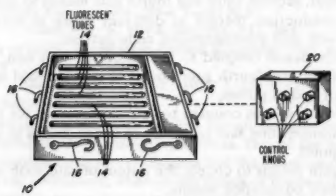
an exciter coupled to the power divider for producing exciter signals, said exciter including a coherent oscillator for generating a coherent signal, means coupled to the coherent oscillator and power divider for selectively mixing the coherent oscillator signal with the signal of the power divider for the exciter, and means for passing a selected side band of the mixed RF signals as an exciter signal.

3,955,199

METHOD OF AND APPARATUS FOR GROUND TESTING DOPPLER NAVIGATION SETS-A DOPPLER RADAR SIMULATOR

Robert W. Hutzelman, Sylmar, and Everitt E. Fairbanks, Arleta, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 21, 1974, Ser. No. 499,249
Int. Cl.[2] G01S 7/40
U.S. Cl. 343—17.7 11 Claims



2. A doppler/range simulator for testing an aircraft doppler velocity/altimeter radar having an antenna comprising:

means for absorbing microwave energy;

a source of ionizable gas mounted within said absorbing means;

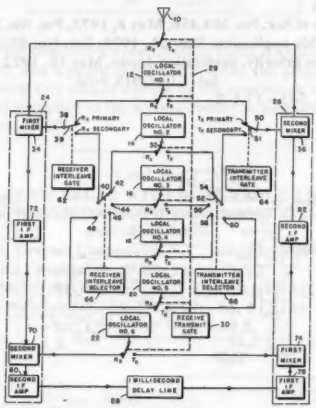
means for exciting said source of gas to create a traveling ionized field to simulate a moving target whereby energy transmitted by said antenna is absorbed by said gas and re-radiated to said antenna to provide an indication of the velocity and distance from the simulated target.

3,955,200

INTERLEAVING JAMMING TECHNIQUE

Leon Miller, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 6, 1961, Ser. No. 101,308
Int. Cl.[2] G01S 7/36
U.S. Cl. 343—18 R 7 Claims



1. The method for producing radio-frequency signals for jamming the detectors in twin channel type variable-time proximity fuzes comprising the steps of detecting a first radio-frequency signal radiated from said variable-time proximity type fuze within a first prescribed range of frequencies, alternately detecting said first signal and a second radio-frequency signal radiated from said fuze within a second prescribed frequency range, the alternating rate being at a frequency much higher than the band-pass of the said variable-time fuze detectors, delaying each of said detected signals a prescribed time in the order that they are detected, sequentially deriving from said delayed detected signals respective radio-frequency signals have frequencies equal to said first and second fuze radiated signals respectively, and alternately transmitting said derived radio frequencies at said alternating rate for a time equal to said delay time to provide interleaved transmitted signals.

3,955,201

RADAR RANDOME ANTENNA WITH SWITCHABLE R.F. TRANSPARENCY/REFLECTIVITY

Lloyd R. Crump, 12108 Atherton Drive, Silver Spring, Md. 20902

Filed July 29, 1974, Ser. No. 492,664
Int. Cl.[2] H01Q 1/42, 3/16
U.S. Cl. 343—701 7 Claims

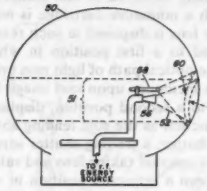
1. An antenna system comprising:

a plurality of antenna segments arranged in a predetermined configuration, the lengths and spacings between the elements being predetermined also;

a plurality of switches, each connected between adjacent ends of at least two antenna segments, the normal condi-

tion of said switches being the open condition, said switches comprising light-responsive diodes;

remotely controlled means comprising light-generating means for selecting and closing a predetermined number



of switches, the selection of switches determining at least one of the following characteristics of the antenna- tuning, reflectivity, directivity, and transparency,

said selecting and closing means being isolated from the R.F. working frequencies of the antenna system.

3,955,202

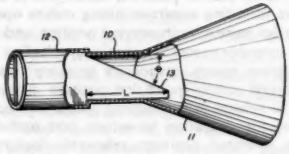
CIRCULARLY POLARIZED WAVE LAUNCHER

Paul T. K. Young, Westwood, Mass., assignor to Macrowave Development Laboratories, Inc., Natick, Mass.

Filed Apr. 15, 1975, Ser. No. 568,280

Int. Cl.² H01Q *13/02, 19/00;* **H01P** *1/16*

U.S. Cl. 343—756 **5 Claims**



1. Apparatus for launching circularly polarized electromagnetic waves comprising a main waveguide having a horn extending from one end thereof, a septum fin centrally disposed in the main waveguide, the septum fin dividing the main waveguide into two subsidiary waveguides each of which is capable of independently supporting the $TE_{1,0}$ mode of wave propagation, the septum fin tapering in width within the main waveguide whereby a progressively enlarged opening is provided between the two subsidiary waveguides which widens in the direction toward the horn and causes a component of the wave energy propagating in the subsidiary waveguides to be shifted in phase relative to another component of that wave energy, and the tapering septum fin protruding from the main waveguide into the horn so that the septum fin has its minimum width in the horn.

3,955,203

HIGH VOLTAGE DEFLECTION ELECTRODE APPARATUS FOR INK JET

Warren L. Chocholaty, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 24, 1975, Ser. No. 543,851

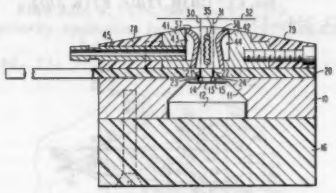
Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **9 Claims**

1. In an ink jet head including means for generating two parallel rows of stream paths of selectively charged drops of conductive fluid and including a source of electric potential, deflection electrode apparatus comprising:

support means;

a pair of electrically conductive planar fine screens supported by said support means in parallel separate relationship and oriented parallel to and extending between said rows of drop stream paths and electrically connected to said source to establish electrostatic deflection fields



for deflecting said charged drops outwardly from said screens; and

vacuum means establishing a vacuum in the space between said pair of screens.

3,955,204

THERMOELECTRIC MATRIX PRINTING HEAD

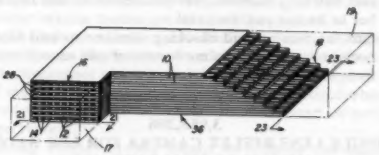
Rainer Anton, Nurnberg, Germany, assignor to Triumph Werke Nurnberg A.G., Nurnberg, Germany

Filed Sept. 25, 1974, Ser. No. 509,091

Claims priority, application Germany, Oct. 24, 1973, 2353182

Int. Cl.² G01D *15/06*

U.S. Cl. 346—139 C **8 Claims**



1. A thermoelectric printing head of the type having printing electrodes for use in a thermoelectric printing process wherein an electrical potential gradient is applied between said printing electrodes positioned at the surface of an expanse of a printing medium containing electrically conductive ink and a counter electrode located on the other side of said printing medium comprising:

a rectangular matrix of precisely spaced printing electrodes for the passage thereagainst of said printing medium wherein said printing electrodes are made by,

cutting slots in a plurality of conductive plates to form a plurality of identical plates each having a number of precisely spaced conductive strips, said strips being electrically and physically joined by an excess portion of said plates and said strips forming at one end a number of printing electrodes and at the other end a number of connecting terminals,

stacking said identical plates in alignment, each plate being separated by an imperforate insulating layer of predetermined thickness,

fixing said stacked plates so that the conductive strips in successive layers are precisely spaced apart,

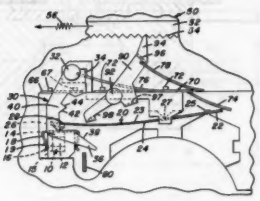
severing said fixed stacked plates and layers from said excess plate portion to electrically isolate said conductors and to form said rectangular matrix.

3,955,205

FILM ADVANCE-FLASH INTERLOCK MECHANISM

Jeffrey Richard Stoneham, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 10, 1975, Ser. No. 557,195
Int. Cl.² G03B 15/03; F21K 5/02
U.S. Cl. 354—135 3 Claims



1. A photographic camera comprising:

means, including a first member movable from a rest position, for advancing film within said camera;

means, including a piezoelectric crystal, for generating electrical energy;

means, including a second member movable from a latched position, for engaging said generating means to generate electrical energy;

means for releasably retaining said second member in said latched position;

means, coupling said first and second movable members, for moving said second member to its latched position in response to movement of said first member from its rest position;

a blocking member movable to a blocking position in which said blocking member prevents return of said first member to its rest position; and

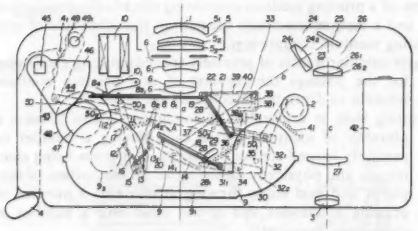
means for moving said blocking member to said blocking position in response to movement of said second member from said latched position.

3,955,206

SINGLE LENS REFLEX CAMERA FOR USE WITH A MINIATURE FILM CARTRIDGE

Teiji Hashimoto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Nov. 7, 1973, Ser. No. 413,492
Claims priority, application Japan, Nov. 8, 1972, 47-111843
Int. Cl.² G03B 9/36, 19/12
U.S. Cl. 354—152 11 Claims



1. Single reflex camera, for use with a miniature film cartridge of the type having two film spool chambers interconnected at one side of the cartridge by a bridge portion to define a recess in the opposite side of the cartridge, with the photosensitive surface of the film, when the cartridge is mounted in the camera, lying in the image-forming plane of the taking lens of the camera, said single lens reflex camera comprising, in combination, a taking lens defining an image-forming plane, a curtain type shutter movable across the optical path of light rays entering through said taking lens; a reflex mirror pivotally mounted in said camera at a position wherein when such a miniature cartridge is mounted in said camera, said reflex lens is disposed in such recess; said reflex mirror being biased to a first position in which it extends obliquely across the optical path of light rays entering through said taking lens for incidence upon said image-forming plane, and being pivotal to a second position, displacing from said optical path, to function as the sole leading shutter screen of said curtain type shutter; a trailing shutter screen positioned in said camera between said taking lens and said reflex mirror and shiftable between a retracted position in which it is displaced from said optical path and a light intercepting position in which it intersects said optical path and blocks the light rays, entering through said taking lens, from incidence upon said image-forming plane, said trailing shutter screen being normally displaced from said optical path; trailing shutter screen control means including shifting means operable to shift said trailing shutter screen to its light intercepting position and returning means operable to shift said trailing shutter screen to its retracted position; releasable latch means locking said returning means in an inoperative state; releasable blocking means blocking said trailing shutter screen in its retracted position and, when released, placing said shifting means in an operative state to shift said trailing shutter screen to its light intercepting position; shutter time control means operable to release said blocking means following the elapse of a predetermined length of time following pivotal movement of said reflex mirror to its second position; reflex mirror operation control means including a mirror raising means operable to rotate said reflex mirror to its second position and a mirror return means operable to rotate said mirror to its first position; said mirror return means, responsive to completion of the movement of said mirror to its first position, releasing said latch means to release said returning means of said trailing shutter screen for operation to return said trailer shutter screen to its retracted position; releasable locking means locking said mirror return means in an inoperative state; said last-named locking means being released by said trailing shutter screen responsive to movement thereof to to said light intercepting position; and release means operable to actuate said mirror raising means to move said mirror to its second position.

3,955,207

CAMERA BELLOWS

Wolfgang Ort, Stuttgart-Bad Cannstatt; Heinz Streicher, Echterdingen; Gerhard Brauning, and Günter Sachs, both of Ruit, all of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

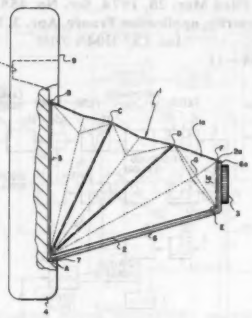
Filed Apr. 10, 1975, Ser. No. 567,038
Claims priority, application Germany, Apr. 25, 1974, 2419986
Int. Cl.² G03B 17/04
U.S. Cl. 354—194 11 Claims

1. In a camera having a box-like housing including an outward facing wall portion and a cover door including a main cover portion having first and second ends and a lens support portion, the main cover portion being coupled at its first end to the lens support portion and at its second end to the housing to provide for pivotal movement of the cover door from an open position wherein the main cover portion projects outwardly from the housing to a closed position wherein the main cover portion lies substantially parallel with the wall portion, a collapsible bellows comprising:

a first bellows portion coupled to the housing and the main cover portion, said first bellows portion forming with the main cover portion a substantially wedge-shaped enclosure when the cover door is in its open position, said first bellows portion lying substantially flat against the main

cover portion when the cover door is in its closed position; and

a second bellows portion coupled to said first bellows portion and the lens support portion, said second bellows



portion forming with the lens support portion a substantially pyramidal enclosure when the cover door is in its open position, said second bellows portion lying substantially flat against the lens support portion when the cover door is in its closed position.

3,955,208

PHOTOGRAPHIC CAMERA WITH LIQUID-CRYSTAL DIAPHRAGM ARRANGEMENT

Richard Wick, Munich; Eduard Wagensonner, Aschheim, and Karl Wagner, Ottobrunn, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed June 6, 1974, Ser. No. 477,087

Claims priority, application Germany, June 7, 1973, 2329014

Int. Cl.² G03B 7/08, 9/56

U.S. Cl. 354—227 **10 Claims**

1. In a photographic camera, a diaphragm arrangement comprising liquid crystal material positioned in the path of light entering the camera, and means for changing the size of the opening of the diaphragm arrangement by alternatively changing the transparency of one or both of at least two portions of the liquid crystal material, the relative positions of said portions being such that when both said portions are non-transparent and viewed in the direction of light entering the camera said portions together form and present to such light an uninterrupted non-transparent zone, and such that when both said portions are transparent and viewed in the direction of light entering the camera said portions together form and present to such light an uninterrupted transparent zone.

3,955,209

DEVICE FOR CONTROLLING AN ELECTRIC FOCAL PLANE SHUTTER

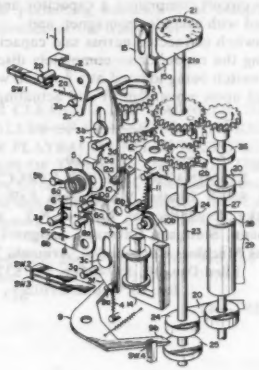
Kazuhiro Akiyama, Omiya, Japan, assignor to Fuji Photo Optical Co. Ltd., Omiya, Japan

Filed June 4, 1974, Ser. No. 476,339

Claims priority, application Japan, June 7, 1973, 48-64042

Int. Cl.² G03B 9/08

U.S. Cl. 354—234 **5 Claims**



1. A device for controlling an electric focal plane shutter in a camera comprising in combination;

a leading shutter curtain movable between a start position and a final position along the focal plane of a camera,

a trailing shutter curtain movable between a start position and a final position along the focal plane of the camera,

a shutter release button provided on the camera,

a shutter release member provided in the camera which is moved upon depression of said shutter release button,

an electromagnet which is excited in response to depression of said shutter release member and demagnetized when a predetermined time has lapsed since the start of excitation thereof,

a leading curtain driving means for making the leading shutter curtain run across the focal plane from the starting position to the final position,

a leading curtain holding means movable between a first position to hold the leading shutter curtain in its start position and a second position to allow the leading shutter curtain to be driven by the leading curtain driving means and run from the start position to the final position,

an actuating member provided between the shutter release member and the leading curtain holding means, and movable between a first position and a second position, said actuating member being moved from the first position to the second position to move the leading curtain holding means from said first position to said second position in response to movement of the shutter release member upon depression of said shutter release button,

a blocking member movable between a blocking position to hold the actuating member in said first position and a releasing position to allow the actuating member to be moved from said first position to said second position,

a trailing curtain driving means for making the trailing shutter curtain run across the focal plane from a start position to a final position,

a trailing curtain holding means movable between a first position to hold the trailing shutter curtain in its start position and a second position to allow the trailing shutter curtain to be driven by the trailing curtain driving means and run from the start position to the final position,

a starting lever which is moved by said electro-magnet upon excitation thereof from a first position wherein the start-

ing lever holds said blocking member in its blocking position and holds said trailing curtain holding means in its first position to a second position wherein the starting lever allows said blocking member to move from its blocking position to its releasing position and allows said trailing curtain holding means to move from its first position to the second position, said starting lever being unmoved by said electromagnet when the voltage applied to the electromagnet is below a predetermined level,

a delay circuit comprising a capacitor and a resistor connected with said electromagnet, and

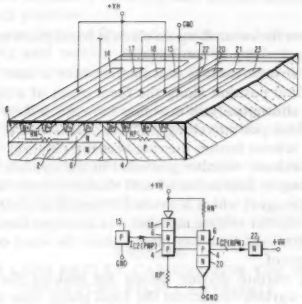
a first switch connected across said capacitor for short-circuiting the capacitor to completely discharge the same, said switch being located at a position where the same is closed upon movement of said actuating member.

3,955,210

ELIMINATION OF SCR STRUCTURE

Harsaran Singh Bhatia, Wappingers Falls; Gerald Dennis O'Rourke, Poughkeepsie, both of N.Y., and Siegfried K. Wiedmann, Stuttgart, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,511
Int. Cl.² H01L 27/02
U.S. Cl. 357—42 **11 Claims**



1. In an integrated circuit device which includes a body of semiconductor material of a first type of conductivity and a pair of insulated gate field effect transistors adjacent a surface thereof, one of which has spaced source and drain regions of conductivity type opposite to said first type in said body, and the other having a pocket region of said opposite type conductivity and a pair of source and drain regions of said first type conductivity within said pocket region, the improvement comprising:

guard regions of said first and opposite conductivity types separating said field effect transistors, the guard region of said first conductivity type being located adjacent the field effect transistor having source and drain regions of said first conductivity type and the guard region of said opposite conductivity type being located adjacent the transistor having source and drain regions of said opposite conductivity type;

means for connecting said first-conductivity-type guard region and said opposite-conductivity-type drain region to a first bias potential; and

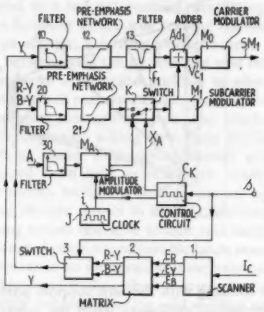
means for connecting said opposite-conductivity-type guard region and said first-conductivity-type source region to a second bias potential.

3,955,211

MULTIPLEX TRANSMISSION OF TELEVISION AUDIO-VISUAL SIGNALS

Jean Paul Peltier; Pierre Oprandi, and René Romeas, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Mar. 28, 1974, Ser. No. 455,811
Claims priority, application France, Apr. 3, 1973, 73.11981
Int. Cl.² H04N 7/04
U.S. Cl. 358—11 **13 Claims**



1. Method of multiplex transmission via a record using for the transcription of television audio-visual signals a frequency modulated carrier waveform, said method comprising the steps of producing a train of sampling pulses emitted at synchronism with the line blanking intervals of said television audio-visual signals; amplitude modulating said sampling pulses with an audio signal pertaining to said television audio-visual signals for delivering a train of modulated sampling pulses; frequency modulating a subcarrier waveform with said train of modulated sampling pulses for forming a modulating signal having a frequency spectrum lying in a frequency range extending above the upper frequency of the luminance signal pertaining to said television audio-visual signals; and modulating said carrier waveform simultaneously with said modulating signal and said luminance signal; said luminance signal comprising horizontal and vertical synchronization pulses; the lowest instantaneous frequency of said frequency modulated carrier waveform being at least equal to the centre frequency of said frequency range.

3,955,212

CONSTANT BANDWIDTH RGB OUTPUT AMPLIFIERS HAVING SIMULTANEOUS GAIN AND DC OUTPUT VOLTAGE CONTROL

Christopher M. Engel, Franklin Park, and George J. Tzakis, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

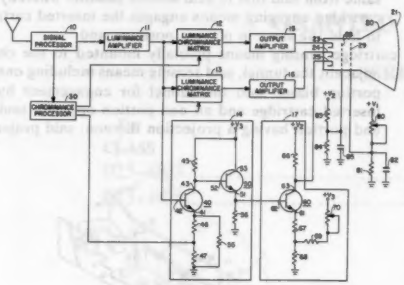
Filed Jan. 3, 1975, Ser. No. 538,632
Int. Cl.² H04N 9/20
U.S. Cl. 358—29 **9 Claims**

1. In a color televison receiver, for processing and displaying a received television signal bearing modulation components of picture information, having a cathode ray tube including a trio of electron source means producing individual electron beams impinging an image screen to form three substantially overlying images and in which the respective operating points and relative conduction levels of said electron source means determine the color temperature of the reproduced image, the combination comprising:

master conduction means, coupled to said trio of electron source means simultaneously varying said conduction levels;

a plurality of substantially equal bandwidth amplifiers, each coupled to a different one of said electron source means, separately influencing said conduction levels;

low output impedance signal translation means recovering said picture information and supplying it to each of said plurality of amplifiers; and



separate adjusting means individually coupled to at least two of said amplifiers for simultaneously producing predetermined same sense variations in gain and DC output voltage of its associated amplifier while preserving said bandwidths.

3,955,213

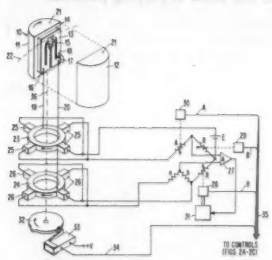
INTERMEDIATE PRODUCT ASSEMBLY OF A MAGNETIC HEAD

Ralph D. Brower, Longmont, and Neil L. Robinson, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1974, Ser. No. 450,138

Int. Cl.[2] G11B *5/22*; **E05F** *11/02*

U.S. Cl. 360—122 **3 Claims**



3. A two-lead magnetic head, comprising a transducer mounted in a housing, for transducing magnetic indicia and electrical signals, which during manufacture has an initial surface dimension greater than that finally required and which surface dimension is reduced by an abrasive material, means providing relative motion between the head and the abrasive material at least by continuously rotating the head, about an axis through aforesaid surface, against the abrasive material to remove surface material, means for monitoring the resistance of the head, including the resistance of at least a protion of an outer element of the head, and means for stopping relative motion when the monitored resistance approaches a predetermined value; said magnetic head during manufacture comprising:

an outer, highly conductive, generally U-shaped, three-segment element, having the middle segment adjacent the initial surface dimension, said outer element being ruptured during surface material removal;

an inner, conductive, generally U-shaped, three-segment element, nested within, and in the plane of, the outer element, having the middle segment adjacent the middle segment of the outer element and separated therefrom;

a pair of conductive means each interconnecting one of respective adjacent ends of each of outer and inner elements; and

two leads, each connected to the element ends at no more than one point on one of said conductive means, for permitting monitoring of the elements' resistance, during surface material removal, until the outer element is ruptured, and permitting conductive of electrical signals during operation of the transducer.

3,955,214

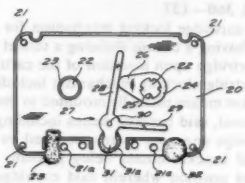
DEVICE FOR CLEANING THE MAGNETIC HEAD AND CAPSTAN ROLLER OF A CASSETTE-TYPE RECORDING AND/OR PLAYBACK UNIT IN RESPONSE TO OPERATION OF THE TAPE DRIVE OF THE UNIT

Herman D. Post, Great Neck; Jack Friedland, Floral Park; Art Seides, Jerico, and George Alexandrovich, Sr., Commack, all of N.Y., assignors to Tobins Industries Corporation, Commack, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,666

Int. Cl.[2] G11B *5/41*; **A47L** *25/00*

U.S. Cl. 360—128 **7 Claims**



1. A device for cleaning the magnetic head and driven capstan roller of a cassette-type recording and/or playback unit having a tape drive, comprising a cassette housing having an open side which faces said head and capstan roller when said housing is placed in operative position on said unit in lieu of a tape cassette, said housing further having a hub rotatable by said drive; first means for wiping the periphery of said capstan roller in response to rotation of the latter; and second means for wiping a tape-engaging surface of said magnetic head and including a cam rotated by said hub and a cam follower which is alternately moved to and fro relative to said open side by said rotated cam.

3,955,215

APPARATUS AND METHOD FOR FORMING A HEAD DRUM ASSEMBLY

Kenichi Hosoi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,904

Claims priority, application Japan, Dec. 14, 1973, 48-144212[U]

Int. Cl.[2] G11B *15/60*, *5/52*, *15/26*

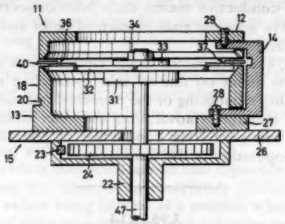
U.S. Cl. 360—130 **9 Claims**

1. A head drum assembly having a rotary magnetic head about which a magnetic tape is wrapped comprising:

a. a smooth drum surface which the tape surface contacts;

b. a tape guide portion being adjacent to said drum surface as one unit and having a projecting portion of said drum surface which engages one edge of said tape and determines the tape position relative to said rotary magnetic head; and

c. a groove formed in the drum surface at the corner between said drum surface and said tape guide portion such



that said tape guide portion forms a very accurate index for said tape.

3,955,216

RETENTION DEVICE FOR ENDLESS CARTRIDGE TAPE RECORDER

Kazumasa Fujita, Iwaki, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

Filed Dec. 13, 1974, Ser. No. 532,621

Int. Cl.[2] G11B *15/00*

U.S. Cl. 360—137 **5 Claims**

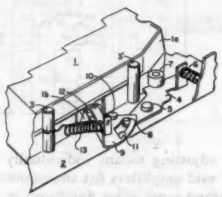
1. A cartridge locking mechanism for use in a tape player device having a chassis defining a tunnel adapted to receive a tape cartridge upon insertion of the cartridge into the tunnel, said cartridge locking mechanism including in combination:

bracket means pivotally mounted to the chassis adjacent the tunnel, said bracket means including a slot therein,

cartridge engaging means mounted on said bracket means, said bracket means being pivotally movable between a first position wherein said cartridge engaging means is positioned outside the tunnel and a second position wherein said cartridge engaging means is in engagement with a cartridge inserted in the tunnel,

spring means coupled to said bracket means to bias the same from said first to said second position whereby said cartridge engaging means engages the inserted cartridge to hold the same in playing position, and

cartridge sensing means pivotally mounted to the chassis adjacent the tunnel, said sensing means including one end portion biased into the tunnel for engagement by the inserted cartridge and an end portion opposite said one end portion having a projection thereon; said projection



being engageable with said slot in said bracket means when said bracket means is in said first position to hold the same outside the tunnel, such that when a cartridge is inserted into the tunnel said one end portion is engaged by the inserted cartridge thereby deflecting said one end portion away from the tunnel and rotating said cartridge sensing means such that said end portion opposite said one end portion disengages said bracket means thereby causing said spring means to bias said bracket means from said first position to said second position and causing said cartridge engaging means to engage the inserted cartridge to hold the same in playing position.

DESIGN PATENTS

GRANTED MAY 4, 1976

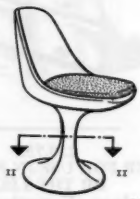
ERRATA

For CLASS	See PATENT NO.
025–003	239,768
025–003	239,769

DESIGNS

MAY 4, 1976

239,743
CHAIR
Enrique Pardo Losada, Carretera Santa Cruz de Calofell Km. 9, 4, San Baudilio de Llobregat, Spain
Filed Mar. 7, 1974, Ser. No. 449,204
Claims priority, application Spain Dec. 5, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26

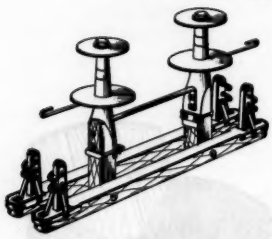


239,744
POLE CLOTHES RACK
Gregory M. Bucknam, Del Mar, Calif. (714 Kennebeck Court, San Diego, Calif. 92109)
Filed Oct. 25, 1974, Ser. No. 346,466
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—28

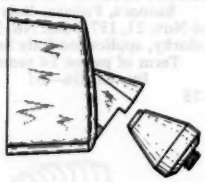
239,745
CHAIR
Donald B. Gold, San Rafael, Calif., assignor to K.I.S.S. Industries, San Rafael, Calif.
Filed Sept. 3, 1974, Ser. No. 502,604
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49

239,746
COLLAPSIBLE CHAIR
Germana Narduzzi, Via Tombelle 9, Saonara, Padova, Italy
Filed Nov. 21, 1974, Ser. No. 526,031
Claims priority, application Italy Sept. 11, 1974
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

239,747
COMBINED SHELF UNIT, PLURAL UMBRELLA SUPPORT STAND AND HOUSEHOLD ACCESSORY RACK OR SIMILAR ARTICLE
George T. Cockman, Rte. 2, Box 364, McLeansville, N.C. 27301
Filed Feb. 13, 1974, Ser. No. 442,051
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—85

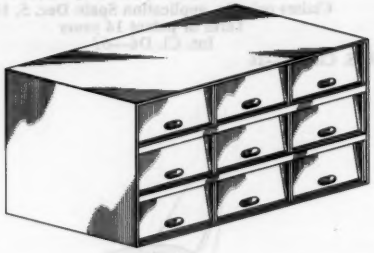


239,748
TUBE HOLDER AND TUBE CAP THEREFOR
Malcolm Mellon and Ann Diaz, both of 22 Riverside Drive, New York, N.Y. 10023
Filed Feb. 3, 1975, Ser. No. 546,529
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—87

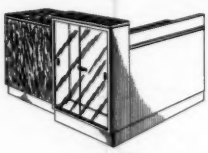


239,749
SOAP REST
Irene Rose, 338 E. 55th St., New York, N.Y. 10022
Filed Apr. 2, 1975, Ser. No. 564,311
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—89

239,750
STORAGE UNIT
John E. Sgombick, Ramsey, N.J., assignor to Xerox Corporation, Stamford, Conn.
Filed May 31, 1974, Ser. No. 475,071
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—160



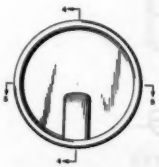
239,751
COUNTER FOR USE IN POST OFFICES OR THE LIKE
Robert M. Fusselman, Youngstown, Ohio, assignor to GF Business Equipment, Inc., Youngstown, Ohio
Filed July 25, 1974, Ser. No. 491,827
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164

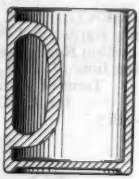


239,752
PULL
La Verne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Jan. 29, 1975, Ser. No. 545,174
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—169

239,753
LOCKER FOR A BICYCLE, MOTORCYCLE OR THE LIKE
Benjamin Agundez III, 5930 Franklin, Los Angeles, Calif. 90028
Filed Oct. 29, 1974, Ser. No. 518,319
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—181

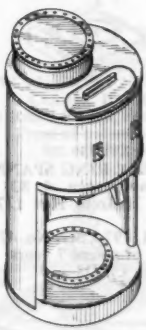
239,754
CUP
Warren A. Yoder, 238 Hayes Ave., Cottage Grove, Oreg. 97424
Filed Nov. 5, 1973, Ser. No. 413,035
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9



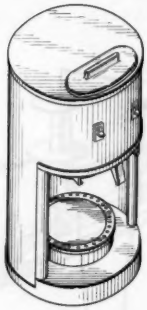


239,755
TACO FORMING TOOL
Larry D. Moore, 122 Broad St., Wadsworth, Ohio 44281
Filed Sept. 3, 1974, Ser. No. 502,813
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—43

239,756
POUR-IN TYPE BEVERAGE MAKER
John C. Martin, Springfield, Ill., assignor to Bunn-O-Matic Corporation
Filed Sept. 17, 1974, Ser. No. 506,831
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—62



239,757
POUR-IN TYPE BEVERAGE MAKER
John C. Martin, Springfield, Ill., assignor to Bunn-O-Matic Corporation
Filed Sept. 17, 1974, Ser. No. 506,877
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—62

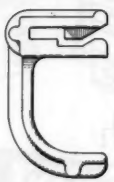


239,758
COFFEE MAKER
Bruce A. Claxton, Springfield, and Thomas E. Hanson, Phoenixville, Pa., assignors to SCM Corporation, New York, N.Y.
Filed Jan. 9, 1975, Ser. No. 540,033
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—85

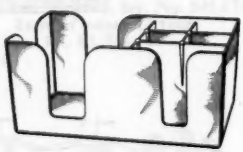
239,759
ADJUSTABLE RING SPANNER
Lennart Glantz, Monstervagen 4, 831 00 Ostersund, Sweden, and Bertil Hellzen, Hov 1279, 830 43, As, Sweden
Filed May 21, 1974, Ser. No. 471,946
Term of patent 7 years
Int. Cl. D8—*05*
U.S. Cl. D8—22

239,760
SWITCH PLATE
George D. Read, Glendora, Lawrence Glen McCain, Beverly Hills, and Edward William Scott, Culver City, Calif., assignors to Ajax Hardware Corporation, City of Industry, Calif.
Filed Oct. 15, 1974, Ser. No. 514,635
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—181

239,761
CLIP FOR WIRES OR THE LIKE
Bradley James Schmidt, East Dundee, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed May 17, 1974, Ser. No. 471,103
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—230



239,762
COMPARTMENTED BOX OR SIMILAR ARTICLE
James Maurice Burden and William James Burden, both of 319 Agostino Road, San Gabriel, Calif. 91778
Filed June 17, 1974, Ser. No. 479,799
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185



239,763
INDICATOR HOUSING FOR AN ELECTRICAL CIRCUIT TESTER
Marvin J. Freed, Tel Aviv, Israel, assignor to Eldar Electronics, Kibbutz Y..d Mordechai, Israel
Filed Oct. 16, 1973, Ser. No. 407,001
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—46

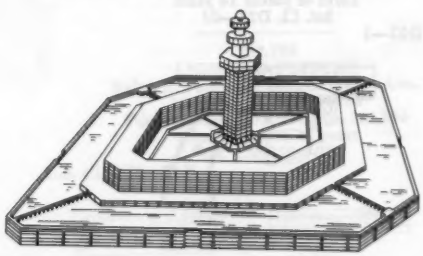
239,764
INDICATOR HOUSING FOR AN ELECTRICAL CIRCUIT TESTER
Marvin J. Freed, Tel Aviv, Israel, assignor to Eldar Electronics, Kibbutz Yad Mordechai, Israel
Filed Oct. 16, 1973, Ser. No. 407,002
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

239,765
VEHICLE TIRE
Mitsuhisa Yahagi, Tokyo, Toshio Hayakawa, Kodaira, and Shigeo Makino, Tokorozawa, Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan
Filed July 14, 1975, Ser. No. 595,615
Claims priority, application Japan Jan. 31, 1975
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142

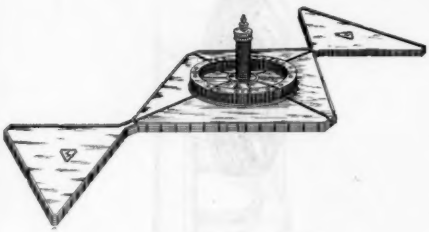
239,766
VEHICLE TIRE
Mitsuhisa Yahagi, Tokyo, Toshio Hayakawa, Kodaira, and Shigeo Makino, Tokorozawa, Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan
Filed July 14, 1975, Ser. No. 595,617
Claims priority, application Japan Jan. 31, 1975
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142

239,767
VEHICLE TIRE
Mitsuhisa Yahagi, Tokyo, Hiroshi Kojima, Hino, and Shigeo Makino, Tokorozawa, Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan
Filed July 14, 1975, Ser. No. 595,618
Claims priority, application Japan Jan. 31, 1975
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142

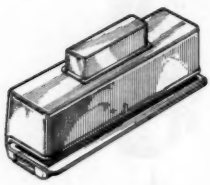
239,768
AIRPORT
John W. Magill, 664 N. Michigan Ave., Chicago, Ill. 60611
Filed June 14, 1972, Ser. No. 262,758
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—3



239,769
AIRPORT
John W. Magill, 664 N. Michigan Ave., Chicago, Ill. 60611
Filed June 14, 1972, Ser. No. 262,759
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—3



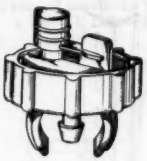
239,770
PAPER PUNCH
Toshio Inoue, Tokyo, Japan, assignor to Carl Manufacturing Company, Ltd., Tokyo, Japan
Filed Sept. 13, 1974, Ser. No. 505,644
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—72



239,771
FLARE LAUNCHING PISTOL
Fred G. Parisi, Northford, Conn., assignor to Olin Corporation, New Haven, Conn.
Filed Feb. 24, 1975, Ser. No. 552,482
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—1

239,772
FISHING LURE
William D. Storm, Norman, Okla., assignor to Storm Plastics, Inc., Norman, Okla.
Filed Nov. 25, 1974, Ser. No. 526,537
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

239,773
TRICKLE IRRIGATION UNIT
William J. Wichman and Richard A. Vander Ploeg, Glendora, Calif., assignors to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed Apr. 23, 1975, Ser. No. 570,588
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—6

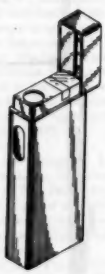


239,774
TELEVISION ANTENNA
Pete Kuldin, 8891 Stout, Detroit, Mich. 48228
Filed Nov. 14, 1974, Ser. No. 524,294
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 F

239,775
SPEAKER HOUSING FOR DRIVE-IN THEATRE
Samuel M. Reed, 2121 Routt, Lakewood, Colo. 80215
Filed Apr. 17, 1974, Ser. No. 461,522
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

239,776
CIGARETTE LIGHTER
Kenjiro Goto, Tokyo, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kawaguchi, Saitama, Japan
Filed Mar. 24, 1975, Ser. No. 561,554
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

239,777
CIGARETTE LIGHTER
Kenjiro Goto, Tokyo, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kawaguchi, Saitama, Japan
Filed Mar. 24, 1975, Ser. No. 561,608
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36



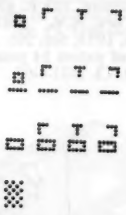
239,778
GOLF PUTTER
Karsten Solheim, 501 W. Wakonda Lane, Phoenix, Ariz. 85023
Filed Nov. 4, 1974, Ser. No. 520,535
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

239,779
TARGET BOARD
Allan M. Elfman, 219 E. 83rd St., New York, N.Y. 10028
Filed Nov. 4, 1974, Ser. No. 520,738
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP

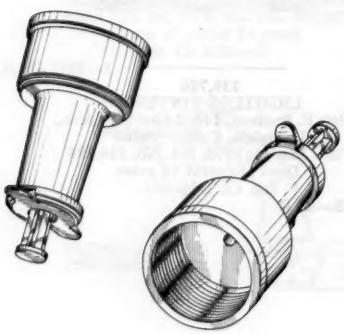
239,780
LIGHTING FIXTURE
Ralph E. Paulson, 14802 Grevillea Ave., Lawndale, Calif. 90260
Filed Jan. 16, 1973, Ser. No. 324,196
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R

239,781
SHRINK TUNNEL PACKAGING APPARATUS
Bernard Katz, Greenwich, Conn. (% Tele-Sonic-Trescott, a division of Empsco, Inc., 18—35 38th St., Long Island City, N.Y. 11105)
Filed Feb. 28, 1975, Ser. No. 554,103
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 C

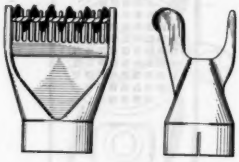
239,782
COMPUTER INPUT/OUTPUT SYMBOL CURSOR TYPE FONT
Michael Arnold Bromberg, Nashua, N.H., assignor to Termiflex Corporation, Nashua, N.H.
Filed Mar. 11, 1974, Ser. No. 449,591
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B



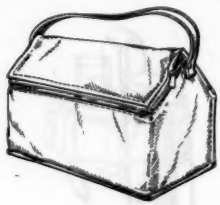
239,783
LIQUID DOSAGE DEVICE
Marja Eriksson, Uppsala, Sweden, assignor to ABM-Mavello AB, Stockholm, Sweden
Filed Nov. 29, 1973, Ser. No. 420,142
Claims priority, application Sweden May 30, 1973
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—8 A



239,784
COMBINED HAIR DRYER NOZZLE, BRUSH AND COMB
Michael G. Vitetta, 311 Fenimore Road, Mamaroneck, N.Y. 10543
Filed Feb. 10, 1975, Ser. No. 548,331
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



239,785
HAND BAG
Maxwell B. Chernoff, Little Silver, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Nov. 5, 1974, Ser. No. 520,994
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 F



239,786
CONVERTIBLE SADDLE BRIEF CASE
Sidney Norinsky, 110 W. 96th St., New York, N.Y. 10025
Filed Dec. 9, 1974, Ser. No. 530,700
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 B

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF MAY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Alfred Benzon: *See—*
Pedersen, Arne Martinus, 3,954,959.

A-T-O Inc.: *See—*
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AB Bofors: *See—*
Andersson, Kenth Yngve, 3,955,176.
Blomqvist, Ake Hugo Petrus; and Eriksson, Bertil Torbjorn, 3,954,340.

Aber, Henry S.; Riggs, Dean D.; and Lamantia, John, to Water Technology Service, Inc. Process of water treatment. 3,954,589, Cl. 204-186.000.

ABIC Ltd.: *See—*
Simonovitch, Chaim; and Stolar, Morris E., 3,954,996.

Abild, Robert N., to United Technologies Corporation. Lever connection to syncring. 3,954,349, Cl. 415-163.000.

Abrahamsen, Theodorus Gerrit; and deBlieck, Tom, to Ultra Centrifuge Nederland N.V. Cold pressure weld, and low-pressure piping system capable of being made with this cold pressure weld. 3,954,122, Cl. 137-561.00A.

Abratis, Horst: *See—*
Maas, Hermann; Abratis, Horst; and Raeune, Claus, 3,954,134.

Accelerators, Inc.: *See—*
Robinson, William P.; and Seliger, Robert L., 3,955,091.

Acheson, Richard M.; Stubbs, John K.; Baxter, Charles A. R.; and Kuhla, Donald E., to Pfizer Inc. Imidazo[2,1-b]thiazole and thiazolo[3,2-a]-benzimidazole quaternary salts as hypoglycemic agents and growth promotants. 3,954,784, Cl. 260-306.70R.

Achorn, Frank P.; and Lewis, Josiah S., Jr., to Tennessee Valley Authority. Granular ammonium phosphate sulfate and monoammonium phosphate using common pipe-cross-type reactor. 3,954,942, Cl. 423-313.000.

Adams, Roman A., to Warwick Electronics Inc. Electrical musical instrument with automatic sequential tone generation. 3,954,038, Cl. 84-1.010.

Addmaster Corporation: *See—*
Busch, Richard E., 3,954,054.

Addor, Roger Williams; and Kantor, Sidney, to American Cyanamid Company. 2-Imino-1,3-dithietanes. 3,954,801, Cl. 260-327.00M.

Addressograph Multigraph Corporation: *See—*
Wu, Alexander C.; and Hou, Shou L., 3,955,128.

Adrian, Norman F.; and Fleming, Joseph P., to Diamond Shamrock Corporation. Process for production of raw mix cement slurries having reduced water content. 3,954,491, Cl. 106-100.000.

Agence Nationale de Valorization de la Recherche (ANVAR): *See—*
Grignard, Robert, 3,954,846.

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Bestenreiner, Friedrich; and Deml, Reinhold, 3,954,334.
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Agui, Hideo; Mitani, Toru; Nakashita, Mitsuo; Murayama, Eiichi; Okamura, Kousaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; and Eda, Yasuko, to Sumitomo Chemical Company, Limited. Thiazolo(5,4-f)quinoline-8-carboxylic acid derivatives. 3,954,775, Cl. 260-287.0CF.

Aid Corporation: *See—*
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Block, Charles S.; Chen, Michael S.; and Noichl, Olaf J., 3,954,606.
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Ajluni, Raymond M.: *See—*
Otrhalek, Joseph V.; and Ajluni, Raymond M., 3,954,645.

Akhundov, Alizakir Alikhady Ogly; Kondukov, Nikolai Borisovich; Vorobiev, Kharlampy Sergeevich; Dementiev, Valentin Matveevich; Kuibyshev, Boris Solomonovich Farber; Zelenov, Alexei Alexandrovich; Logvinov, Vladimir Alexandrovich; Polinkovskaya, Anna Ilinichna; and Petrikhina, Galina Alexandrovna. Method for producing aggregate used in hardening compositions, predominantly concretes, a fluidized-bed kiln for calcining mineral stock by means of same method, and an aggregate produced by same method. 3,954,390, Cl. 432-14.000.

Akimoto, Hiroshi: *See—*
Sugimoto, Keiichi; Nishijima, Koji; Akimoto, Hiroshi; Hanaoka, Tadashi; and Kakeya, Nobuharu, 3,954,826.

Akiyama, Kazuhiro, to Fuji Photo Optical Co. Ltd. Device for controlling an electric focal plane shutter. 3,955,209, Cl. 354-234.000.

Aktieselskabet Grindstedvaerket: *See—*
Nedenskov, Poul; and Alster, Karol, 3,954,813.

Akzona Incorporated: *See—*
Wegerhoff, Arno; and Frank, Dieter, 3,954,879.

Albrecht, William L.; and Jones, Winton D., to Richardson-Merrell Inc. Triazolocycloalkylhydrothiadiazine derivatives. 3,954,981, Cl. 424-246.000.

Albrecht, William L.; and Sweet, Francis W., to Richardson-Merrell Inc. Triazolobenzocycloalkylthiadiazine derivatives. 3,954,983, Cl. 424-246.000.

Albrecht, William L., to Richardson-Merrell Inc. Triazolocycloalkylthiadiazine derivatives. 3,954,984, Cl. 424-246.000.

Albright & Wilson Limited: *See—*
Gyllenspetz, Jeffrey; and Renton, Stanley, 3,954,574.

Alco Standard Corporation: *See—*
Vegh, Elmer S.; and Klier, Donald F., 3,954,052.

Aldcroft, Derek; Barby, Donald; Lovell, Anthony Leonard; and Quinn, James Philip, to Joseph Crosfield & Sons, Ltd. Fine silicas. 3,954,944, Cl. 423-335.000.

Aleksoff, Carl C.; and Christensen, Charles R., to United States of America, Army. Holographic Doppler-spread imaging of moving objects. 3,954,322, Cl. 350-3.500.

Alexandrovich, George, Sr.: *See—*
Post, Herman D.; Friedland, Jack; Seides, Art; and Alexandrovich, George, Sr., 3,955,214.

Alfrey, James L., to Scott & Fetzer Company, The. Ratchet switch. 3,955,058, Cl. 200-156.000.

Alfter, Franz-Werner; Breitscheidel, Hans-Ulrich; Reinkemeyer, Heinz-Gerd; and Simm, Manfred, to Dynamit Nobel Aktiengesellschaft. Production of multiple-layer sheets, panels, shaped articles. 3,954,537, Cl. 156-82.000.

Allegheny Ludlum Industries, Inc.: *See—*
Malagari, Frank A., Jr., 3,954,521.

Allen, David A.: *See—*
Lu, Chin H.; and Allen, David A., 3,954,640.

Allen, Joseph C., to Texaco Inc. Secondary recovery by miscible vertical drive. 3,954,139, Cl. 166-272.000.

Allen, Joseph C.; Woodward, Charles D.; Brown, Alfred; and Wu, Ching H., to Texaco Inc. Multiple solvent heavy oil recovery method. 3,954,141, Cl. 166-274.000.

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Allergan Pharmaceuticals: *See—*
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Koenig, James J., 3,954,957.
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Willis, Wilburn C., 3,954,200.

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Ambler, James R.; and Hewitt, Robert W. M., to G. T. Schjeldahl Company. Stacking wheels with superimposed retarder action. 3,954,367, Cl. 425-289.000.

Amelio, Gilbert F.; and Early, James M., to Fairchild Camera and Instrument Coporation. Dynamic reference voltage generator. 3,955,101, Cl. 307-235.00H.

American Aniline Products, Inc.: *See—*
Renfrew, Edgar Earl; and Genta, Guido Ruggiero Lorenzo, 3,954,830.

American Can Company: *See—*
Dobbins, Walter James, 3,954,003.

American Chain & Cable Company, Inc.: *See—*
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American Cyanamid Company: *See—*
Addor, Roger Williams; and Kantor, Sidney, 3,954,801.
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Cummings, Percival W., Jr.; Goodman, John H., III; Glick, Arthur; McPherson, James B., Jr.; and McCusker, Edward J., 3,954,635.
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American Medical Systems, Inc.: *See—*
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American Optical Corporation: *See—*
Deeg, Emil W.; and Graf, Robert E., 3,954,656.

American Sterilizer Company: *See—*
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Amerock Corporation: *See—*
Johnson, Robert W., 3,954,292.
Ames, Marc L. Extensible rear view mirror. 3,954,328, Cl. 350-304.000.
AMF Incorporated: *See—*
Petrucci, Raymond M., 3,954,624.
AMP Incorporated: *See—*
Gilissen, Hermanus Petrus Johannes; and van Dijk, Petrus Richardus Martinus, 3,954,317.
Hoffman, Ronald Clarence; Lemke, Timothy Allen; and Swengel, Robert Charles, Sr., 3,955,044.
Rolland, Claude; and Delalle, Jacques, 3,953,916.
Shirk, Albert; and Ceresa, Myron, 3,954,570.
Anaconda Company, The: *See—*
Kuhn, Martin C.; and Arbiter, Nathaniel, 3,954,450.
Analytical Instruments Limited: *See—*
Jenkins, Anthony; and Isgrove, Douglas Walter, 3,955,139.
Andary, William A.; and Somes, Corydon L. Automatic toothbrush sterilizer. 3,954,407, Cl. 21-83.000.
Andersen, Egil A., to United States Envelope Company. Turn bar apparatus and method for web fed envelope machine. 3,954,213, Cl. 226-7.000.
Anderson Company, The: *See—*
Loskill, Lawrence R., 3,953,908.
Anderson, John Norton: *See—*
Schulz, Donald Norman; and Anderson, John Norton, 3,954,885.
Anderson, Kent V., to ESB Incorporated. Multicell alkaline primary battery. 3,954,505, Cl. 136-110.000.
Anderson, Robert F.: *See—*
Butler, William K.; and Anderson, Robert F., 3,955,125.
Anderson, Ronald A.; and Smolen, James J., to Schlumberger Technology Corporation. Methods for determining velocities and flow rates of fluids flowing in well bore. 3,954,006, Cl. 73-155.000.
Anderson, Roy; and Schuman, Paul D., to PCR, Inc. Process for preparation of 6-substituted 5-fluorouracil derivatives. 3,954,759, Cl. 260-260.000.
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Andrews, John H. P., Jr.; Ehrlich, Stephen J.; and Rodriguez, Rudolfo R., to Becton, Dickinson and Company. Multiple shot pipetter. 3,954,014, Cl. 73-425.600.
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Andrews, Timothy Douglas; Short, Glyn David; and van Ingen, Jan Willem Frederik, to Imperial Chemical Industries Limited. Photographic fixing process. 3,954,471, Cl. 96-48.00R.
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Anton, Rainer, to Triumph Werke Nurnberg A.G. Thermoelectric matrix printing head. 3,955,204, Cl. 346-139.00C.
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Arai, Naoki; and Ohi, Reiichi, to Fuji Photo Film Co., Ltd. Silver halide emulsion containing an alkenyl benzothiazolium salt as stabilizer. 3,954,478, Cl. 96-100.000.
Araki, Shinichi, to Lion Fat and Oil Co. Ltd., The. Pouring cap for liquid container. 3,954,211, Cl. 222-562.000.
Arbiter, Nathaniel: *See—*
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Arisaka, Masayuki; and Horiuchi, Hideo, to Fuji Photo Film Co., Ltd. Film unit assembly. 3,954,477, Cl. 96-76.00R.
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Armstrong Cork Company: *See—*
Chamberlain, Walter W., III, 3,954,540.
Arnott, Robin A.; and Domaracki, John F., to International Tools (1973) Limited. Pavement marker having conical retro-reflectors. 3,954,324, Cl. 350-109.000.
Aron, Richard M. Reversible necktie and method of production. 3,953,894, Cl. 2-146.000.
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Asada, Hidekazu: *See—*
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Ashe, John B., to G. D. Searle & Co. Apparatus for measuring moisture in moving bulk material using a lithium-7 radiation source. 3,955,087, Cl. 250-360.000.
Ashe, Thomas A., to Du Pont de Nemours, E. I., and Company. Graft copolymers having an acid anhydride copolymer backbone. 3,954,705, Cl. 260-42.570.
Astley, Eugene R.; and Forsen, Harold K., to Exxon Nuclear Company, Inc. Sputtered particle flow source for isotopically selective ionization. 3,955,090, Cl. 250-423.000.
Atkey, Richard E., to Dover Corporation. Elevator lifting frame. 3,954,157, Cl. 187-17.000.
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Attwood, Brian William: *See—*
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Aurenz, Hans-Dieter, to Jenaer Glaswerk Schott & Gen. Apparatus for the manufacture of optical-fiber bundles. 3,954,546, Cl. 156-433.000.
Australian Selection: *See—*
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Awerbuch, Leon; and Draney, Charles T., to Bechtel International Corporation. Geothermal energy recovery process. 3,953,972, Cl. 60-641.000.
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Barber, Stanley. Spanner beam hanger assembly. 3,954,248, Cl. 249-211.000.
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Barbron Corporation: *See—*
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Barczynski, J. Robert; and Janssen, Jerry F., to GTE Sylvania Incorporated. Radiant energy emitter for color CRT fabrication. 3,955,094, Cl. 250-527.000.
Barlow, Roland J., to Ex-Cell-O Corporation. Rotary actuator valve. 3,954,045, Cl. 91-382.000.

Barnes, Albert J.: *See—*
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Baroni, Fausto: *See—*
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Barrett, Paul Anthony, to Burroughs Wellcome Co. 1-(Halo-biphenyl)-1-(halo-phenyl)-3-aminoprop-1-enes and the salts thereof. 3,954,869, Cl. 260-570.00R.

Barta, Cestmir; Liska, Oldrich; Louda, Jaroslav; Ryttnauer, Emil; and Zemlicka, Jan, to Ceskoslovenska akademie ved. Method of working, forming and finishing single crystals. 3,954,096, Cl. 125-1.000.

Barth, Hansjochen; and Bauer, Johann, to Wacker Chemie GmbH. Apparatus for the preparation of foamed thermoplastic extruded profiles. 3,954,365, Cl. 425-197.000.

Bartha, Bela: *See—*
Vad, Janos; Bartha, Bela; Nadasy, Miklos; Dobozy, Otto; Mate, Ferenc; Kovacs, Miklos; Kolcsei, Marton; and Karacsonyi, Eva, nee Spindler, 3,954,436.

Barton, Derek Harold Richard; and Hesse, Robert H. Chemical compounds. 3,954,980, Cl. 424-241.000.

BASF Aktiengesellschaft: *See—*
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Basic Microelectronics, Inc.: *See—*
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Battista, Orlando A.; and Ward, Richard L., to Avicon, Inc. Regenerated cellulose sponge. 3,954,493, Cl. 106-127.000.

Batzar, Kenneth, to Du Pont de Nemours, E. I., and Company. Preparation of dense silica-encapsulated aluminum flake pigment treated with a carboxylic chromic chloride. 3,954,496, Cl. 106-308.00B.

Baudouin, Michel, to Rhone-Poulenc Textile. Process for the preparation of 2-phenyl-ethanol. 3,954,888, Cl. 260-618.00R.

Bauer, Johann: *See—*
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Baugh, Benton F., to Vetco Offshore Industries, Inc. Sub-sea well reentry guidance apparatus. 3,954,137, Cl. 166-.600.

Bausch & Lomb Incorporated: *See—*
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Beatty, Charles L.; Lindblad, Nero R.; and Till, Henry R., to Xerox Corporation. Electrostatographic photoreceptor. 3,954,466, Cl. 96-1.500.

Beaulieu, Thomas J.; Marchese, Michael A.; Plante, Franklin T.; and Tlaskal, Robert H., to International Business Machines Corporation. Process for the production of magnetic materials. 3,954,520, Cl. 148-105.000.

Bech, Otto Mathias Andreas, to Brown, James L. Combination saw. 3,954,036, Cl. 83-749.000.

Bechtel International Corporation: *See—*
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Beck, John Brewer, to RCA Corporation. Transistor amplifier stage with device in its temperature compensated bias network used as preliminary amplifier. 3,955,108, Cl. 307-297.000.

Becker, Reinhard, to Deere & Company. Cell wheel for singling and separating seeds. 3,954,204, Cl. 221-211.000.

Becker, Werner; Langeluddeke, Peter; Leditschke, Heinrich; Nahm, Helmut; and Schwerdtle, Friedhelm, to Hoechst Aktiengesellschaft. Herbicidal compositions. 3,954,442, Cl. 71-108.000.

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Behenna, Joshua J.; and Phipps, Graham Harold George, to International Standard Electric Corporation. Magnetically focused electron beam tube. 3,955,114, Cl. 313-36.000.

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Behrenz, Wolfgang: *See—*
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Belcak, Edward John; and Corcoran, Leo Francis, to Pennwalt Corporation. Coatings removal composition containing an alkali metal hydroxide, an oxygenated organic solvent, and an amine. 3,954,648, Cl. 252-158.000.

Bell Telephone Laboratories, Incorporated: *See—*
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Bencz, Gyozo: *See—*
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Bengtsson, Sigurd Walter. Combined tooth pick and tooth cleaning implement. 3,954,115, Cl. 132-89.000.

Beninate, John V.: *See—*
Reeves, Wilson A.; Donaldson, Darrell J.; Daigle, Donald J.; Drake, George L., Jr.; and Beninate, John V., 3,954,400.

Benisek, Ladislav, to I.W.S. Nominee Company Limited. Textile treatment. 3,954,402, Cl. 8-128.00R.

Benjamin, Robert E.: *See—*
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Bennett, Floyd William: *See—*
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Bennett, Gerald B., to Bennett, Floyd William. Dock structure. 3,953,980, Cl. 61-48.000.

Berg, Morris: *See—*
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Berger, Jenson & Nicholson Limited: *See—*
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Berger, Raymond D. Warmed shield to direct strikes of snakes. 3,955,063, Cl. 219-211.000.

Bernard, Claude, to Saint-Gobain Techniques Nouvelles. Treatment of irradiated nuclear fuel. 3,954,654, Cl. 252-301.10W.

Berndt, Neil R.: *See—*
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Berol Corporation: *See—*
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Berol Kemi AB: *See—*
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Berry, Johnny L., to Texas Instruments Incorporated. Multiple de-Q-ing circuit for a moving target indicator radar system. 3,955,106, Cl. 307-268.000.

Bert, Georges, to Thomson-CSF. Transistorised memory cell and an integrated memory using such a cell. 3,955,182, Cl. 340-173.0FF.

Bertin & Cie: *See—*
Croix-Marie, Francis Jean-Marie; and Lebargy, Paul Aime, 3,954,153.

Berzinya, Anna Eduardovna: *See—*
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Bestenreiner, Friedrich; and Deml, Reinhold, to AGFA-Gevaert, A.G. Apparatus for recording with a lenticular grating. 3,954,334, Cl. 355-52.000.

Bhagat, Gopal C., to Xerox Corporation. Method for electrostatic printing. 3,954,463, Cl. 96-1.400.

Bhalla, Sushil K.: *See*—
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Bhatia, Harsaran Singh; O'Rourke, Gerald Dennis; and Wiedmann, Siegfried K., to International Business Machines Corporation. Elimination of SCR structure. 3,955,210, Cl. 357-42.000.

Bickel, Hans: *See*—
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Bickling, Archie L., Jr.: *See*—
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Bigelow, John E., to General Electric Company. Proportioning the address and data signals in a r.m.s. responsive display device matrix to obtain zero cross-talk and maximum contrast. 3,955,187, Cl. 340-324.00M.

Billet, Reinhard: *See*—
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Bioresearch Limited: *See*—
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Birum, Gail H., to Monsanto Company. Phosphorous compounds. 3,954,860, Cl. 260-553.00R.

Bitzer, Jack J.; and Jobes, Alton T., Jr., to Plantronics. Data set with bridge for duplex operation. 3,955,051, Cl. 179-2.0DP.

Bjorklund, Curt Arnold; and Thomasson, Assar. Water mixer. 3,954,222, Cl. 236-12.00R.

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Black, James Whyte; and Parsons, Michael Edward, to Smith Kline & French Laboratories Limited. Pharmaceutical compositions and method of inhibiting H-1 and H-2 histamine receptors. 3,954,982, Cl. 424-246.000.

Blair, Calvin B. Folding implement chain lifter. 3,954,144, Cl. 172-311.000.

Blake, Charles H., to Outboard Marine Corporation. Outboard motor with speed regulator for DC permanent magnet motor. 3,954,081, Cl. 115-18.00E.

Blakely, John Alexander, to Texas Instruments Incorporated. Black dielectric mask on white substrate. 3,955,023, Cl. 428-201.000.

Blanco, Milagros V.: *See*—
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Bliss, Joseph Francis, to Union Carbide Corporation. Amine hardner compositions. 3,954,650, Cl. 252-182.000.

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Bloch, Eric. Prosthetic one-way heart valve. 3,953,898, Cl. 3-1.500.

Block, Charles S.; Chen, Michael S.; and Noichl, Olaf J., to Air Products and Chemicals, Inc. Wastewater treatment system with controlled mixing. 3,954,606, Cl. 210-14.000.

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Blomqvist, Ake Hugo Petrus; and Eriksson, Bertil Torbjorn, to AB Bofors. Method of and apparatus for target tracking. 3,954,340, Cl. 356-152.000.

Blood, Alden E.: *See*—
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Bloom, Melvin S.; and Fico, Sally S., to Eastman Kodak Company. Photosensitive material comprising polyacetylenic amine salts. 3,954,816, Cl. 260-404.500.

Blount, David H. Process for production of monosilandiol. 3,954,941, Cl. 423-325.000.

Blows, Dennis George: *See*—
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Bobenswerkerk Perkin-Elmer & Co. GmbH: *See*—
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Boddeker, Karl W., to Gesellschaft fur Kernenergieverwertung in Schiffbau u. Schiffahrt mbH. Method of making semi-permeable asymmetric membranes for reverse osmosis. 3,954,925, Cl. 264-41.000.

Bodlaj, Viktor, to Siemens AG. Method and apparatus for measuring range and speed of an object relative to a datum plane. 3,954,335, Cl. 356-4.000.

Bodor, Nicolae S.; and Kaminski, James J., to INTERx Research Corporation. Method for inhibiting bacterial growth with certain selected 3-chloro-tetrahydro-1,3-oxazines or oxazolidines. 3,954,985, Cl. 424-248.000.

Bodson, Fernand Jacques Joseph. Process for the treatment of material containing zinc and silica for recovering of zinc by hydrometallurgic way. 3,954,937, Cl. 423-101.000.

Boehm, Frederick A.: *See*—
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Boehm, Vera L.; and Boehm, Frederick A. Tandem tricycle. 3,954,283, Cl. 280-273.000.

Boehringer Ingelheim GmbH: *See*—
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Boeing Company, The: *See*—
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Harper, Philip M., 3,954,232.
Lambregts, Antonius A., 3,955,071.

Boeke, Jan. Optical device for monitoring clarity of a fluid. 3,954,342, Cl. 356-206.000.

Boesch, Donald Edward; and Koita, Yusuf Taher, to Western Electric Co., Inc. Transfer molding thermosetting polymeric material. 3,954,362, Cl. 425-130.000.

Boghosian, Malcolm P.; Blanco, Milagros V.; and Karageozian, Hampar L., to Allergan Pharmaceuticals. Composition and method of sterilizing soft contact lenses and method for preventing formation of proteinaceous deposits thereon. 3,954,965, Cl. 424-81.000.

Bognar, Rezso: *See*—
Knoll, Jozsef; Furst, Zsuzsanna; Meszaros, Zoltan; Szentmiklosi, Peter; David, Agoston; Hermecz, Istvan; Mandi, Attila; Bognar, Rezso; Makleit, Sandor; Valovics, Gyula; Szlavik, Laszlo; and Nagy, Sandor, 3,954,986.

Bohme, Ekkehard: *See*—
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Bohrer, James Calvin; and Hewitt, Gordon Trent, to Colgate-Palmolive Company. Method of and means for cleaning hair between shampoos and methods for preparing such means. 3,954,113, Cl. 132-7.000.

Boiko, Ivan Danilovich; and Naidin, Anatoly Vladimirovich. Apparatus for cultivating microorganisms. 3,954,565, Cl. 195-142.000.

Bolis, Ernesto. Method for making ribbons curlable in a cockade fashion. 3,954,212, Cl. 223-46.000.

Bone, Kendall Frederick; and Johansson, Oskar Reinhold, to cincinnati Milacron, Inc. Machine tool with automatic tool changer. 3,953,918, Cl. 29-568.000.

Bonham, James A.; and Petrellis, Panayotis C., to Minnesota Mining and Manufacturing Company. Photosensitive elements containing chromophore-substituted vinyl-halomethyl-s-triazines. 3,954,475, Cl. 96-67.000.

Bonneville, Jacques: *See*—
Kellow, Mazin; Vansant, James; and Bonneville, Jacques, 3,955,042.

Boos, Walter R.: *See*—
von Schmeling, Bogislav; and Boos, Walter R., 3,954,868.

Borden, Howard C., to Ceramic Systems. Multilayer ceramic-based liquid crystal display. 3,954,325, Cl. 350-160.0LC.

Boring, Douglas James, to Conair, Inc. Vacuum loader system. 3,954,303, Cl. 302-62.000.

Boring & Tunneling Co. of America, Inc.: *See*—
Stepp, Clarence L., 3,954,301.

Boris, Michel, to Societe Technique de Pulverisation. Sliding piston pump, especially for vapourizers. 3,954,354, Cl. 417-479.000.

Borror, Alan L., to Polaroid Corporation. Protonated indole phthalides and naphthalides. 3,954,799, Cl. 260-326.12R.

Boschnakow, Ivan; and Frohlich, Hans, to Zentralinstitut fur Schweisstechnik der Deutschen Demokratischen Republik. Flame cutting by means of an oxygen beam. 3,954,513, Cl. 148-9.00R.

Bottomley, Herbert G., to Landis Lund Limited. High frequency loader assembly. 3,954,164, Cl. 198-27.000.

Bouchoux, Jean W.; and Larkin, William A., to M&T Chemicals Inc. Stabilized epsilon caprolactam composition and method of preparing same. 3,954,738, Cl. 260-239.30R.

Bower, George M.; and Skena, Richard M., to Westinghouse Electric Corporation. Polymers prepared from imide containing dianhydrides. 3,954,710, Cl. 260-47.0CP.

Bowler, Jean, to Imperial Chemical Industries Limited. Prostanoic acid derivatives. 3,954,881, Cl. 260-613.00D.

Bowman, Benton O., to Ceres Products Company, Inc. Process for preparing stabilized yeast and compositions and tableting composition and method. 3,954,979, Cl. 424-195.000.

Boyle, Robert F., to Prab Conveyors, Inc. Universal transfer device. 3,954,188, Cl. 214-1.0BC.

BP Chemicals International Limited: *See*—
Bradley, Basil John; Craig, Peter James; and Gammon, Geoffrey James, 3,954,698.

Brabec, Norman A.: *See*—
Skipor, Eugen; and Brabec, Norman A., 3,954,258.

Brackmann, Warren A.; and Di Ianni, Daniel, to Rothmans of Pall Mall Canada Limited. Tobacco filler rod production. 3,954,112, Cl. 131-21.00D.

Bradley, Basil John; Craig, Peter James; and Gammon, Geoffrey James, to BP Chemicals International Limited. Polymerisation process. 3,954,698, Cl. 526-79.000.

Bradley, Jack: *See*—
Stephens, Berton H.; and Bradley, Jack, 3,955,140.

Bradshaw, Paul E.: *See*—
Grace, Michael H., 3,954,250.

Brange, Lennart Bertil Vilhelm, to Inoma Filter AB. Method for cleaning a dust filter. 3,954,426, Cl. 55-96.000.

Braun, Egon, to Maschinenfabrik, Niehoff KG. Multi-stage wire drawing machine. 3,953,998, Cl. 72-289.000.

Braun, Ernst; and Braun, Gert, to Halbach & Braun. Single chain conveyor. 3,954,168, Cl. 198-171.000.

Braun, Gert: *See*—
Braun, Ernst; and Braun, Gert, 3,954,168.

Brauning, Gerhard: *See*—
Ort, Wolfgang; Streicher, Heinz; Brauning, Gerhard; and Sachs, Gunter, 3,955,207.

Brawner, William H.; Gunsalus, Claude A.; and Rockwell, Lowell K., to Summer, Dale E.; Rockwell, Lowell K.; Rogers, Paul C.; Laznibat, Nick A.; Gunsalus, Claude A.; Brawner, William H.; Kimmich, Gordon R.; Plourde, Leonard J.; McGuire, Marcus W.; and Smyth, George F., part interest to each. Can bodies and method and apparatus for manufacture thereof. 3,953,994, Cl. 72-58.000.

Breen, Alvin L., deceased; by Breen, Richard D., administrator; and Lauterbach, Herbert G., to Du Pont de Nemours, E. I., and Company. Crimped thermoplastic synthetic filaments of asymmetric composition. 3,953,962, Cl. 57-140.00R.

Breen, Richard D., administrator: *See*—
Breen, Alvin L., deceased; Breen, Richard D., administrator; and Lauterbach, Herbert G., 3,953,962.

Breitscheidel, Hans-Ulrich: *See*—
Alfter, Franz-Werner; Breitscheidel, Hans-Ulrich; Reinkemeyer, Heinz-Gerd; and Simm, Manfred, 3,954,537.

Brennan, Richard L., to United States of America, Navy. Circuit for coupling an antenna to a load. 3,955,146, Cl. 330-17.000.

Bresson, Clarence R.; and Spaulding, Forrest D., to Phillips Petroleum Company. Impervious barrier comprising polyolefin fabric, asphalt and asbestos. 3,953,974, Cl. 61-1.00R.

Bretford Manufacturing, Inc.: *See*—
Petrick, Russell E., 3,954,202.

Bretschneider, Hermann: *See*—
Hellerbach, Joseph; Walser, Armin; Bretschneider, Hermann; and Rudolph, Werner, 3,954,838.

Bridge, Richard R.: *See*—
Walker, James Donald; and Bridge, Richard R., 3,954,922.

Bridgestone Tire Company Limited: *See*—
Hoshino, Takashi; and Fujikawa, Akira, 3,954,131.
Nisimura, Seiichiro, 3,953,942.

Brieske, Bernard F., to Vision Wrap Industries, Inc. Method of making flexible bag. 3,954,049, Cl. 93-35.00R.

Brill, Roy N. Dispenser valve structure. 3,954,208, Cl. 222-402.230.

Brittingham, Vertner David. Indiciaed ball having loose interior weight. 3,954,269, Cl. 273-138.00R.

Broaddus, Gene C.; and Fredrickson, Sherman E., to Halliburton Company. Zonal fracture treatment of well formations. 3,954,142, Cl. 166-307.000.

Brockhaus, Rudolf, to Chemische Werke Huls Aktiengesellschaft. Process for preparing acetic acid by gas-phase oxidation. 3,954,857, Cl. 260-533.00R.

Broderick, Frank William, to Standex International Corporation. Rotary cutting mechanism. 3,954,034, Cl. 83-117.000.

Broecker, Franz Josef; Reiss, Wolfgang; Baer, Karl; Winderl, Siegfried; Schroeder, Wolfgang; and Hoffmann, Herwig, to BASF Aktiengesellschaft. Process for making an ethynylation catalyst. 3,954,669, Cl. 252-431.00R.

Broemer, Heinz; and Meinert, Norbert, to Ernst Leitz G.m.b.H. Fluorophosphate glass and process of making same. 3,954,484, Cl. 106-47.00Q.

Brothers, Don R.; and Stewart, Edwin D., to Century Industries Corporation. Apparatus for forming caulking tube cartridges. 3,953,957, Cl. 53-329.000.

Brower, Ralph D.; and Robinson, Neil L., to International Business Machines Corporation. Intermediate product assembly of a magnetic head. 3,955,213, Cl. 360-122.000.

Brown, Alfred: *See*—
Allen, Joseph C.; Woodward, Charles D.; Brown, Alfred; and Wu, Ching H., 3,954,141.

Brown, Boveri & Cie. A.G.: *See*—
Dabringhausen, Friedhelm; and Neumaier, Heinrich, 3,955,057.

Brown, Clarence K. Fastener assembly. 3,953,906, Cl. 10-27.00R.

Brown, George E., Jr., to Safe-Tech, Inc. Detergent compositions and dishwashing method. 3,954,500, Cl. 134-25.00R.

Brown International Corporation: *See*—
Holbrook, Franklin K., 3,954,032.

Brown, James L.: *See*—
Bech, Otto Mathias Andreas, 3,954,036.

Brown, Perry H.; and Tremblay, Maurice H., to Brunswick Corporation. Velvet fabric. 3,953,913, Cl. 28-76.00P.

Brown, Roswell F. Wind actuated rotatable tubular device. 3,954,236, Cl. 244-155.00R.

Brown, Thomas A.: *See*—
Huber, Joseph B.; and Brown, Thomas A., 3,953,914.

Browning, Eric John, to Coal Industry (Patents) Limited. Apparatus for ventilating cutter heads of mineral mining machines. 3,954,302, Cl. 299-81.000.

Brunswick Corporation: *See*—
Brown, Perry H.; and Tremblay, Maurice H., 3,953,913.

Bryant, Jack A., to Electronics Corporation of America. Burner control system. 3,954,383, Cl. 431-24.000.

Buckle, Allan Stanley: *See*—
Ives, Andrew Peter; Hodgson, Duncan Barry; Buckle, Allan Stanley; and Halmshaw, Raymond Paul, 3,955,174.

Buckley, David Alan, to Xerox Corporation. Preparation of red amorphous selenium. 3,954,951, Cl. 423-510.000.

Budevska, Hrisanta Nicolaeva: *See*—
Mostev, Rafail Velislavov; Budevska, Hrisanta Nicolaeva; and Ivanova, Latinca Tantilova, 3,955,014.

Budzich, Tadeusz; and Filip, Stanislaw, to KLF Patents, Inventions, and Marketing Corporation Limited. Safety control for mobile vehicles. 3,954,151, Cl. 180-103.00R.

Burkhart, Gordon H.: *See*—
Rice, Robert R.; Allen, Louis B., Jr.; Burkhart, Gordon H.; and Koenig, Herbert G., Jr., 3,954,940.

Burnett, Jesse A.: *See*—
Jatczak, Chester F.; Burnett, Jesse A.; and Mohr, Terry W., 3,954,517.

Burnham, Robert D.: *See*—
Scifres, Donald R.; and Burnham, Robert D., 3,954,534.

Burroughs Wellcome Co.: *See*—
Barrett, Paul Anthony, 3,954,869.
Wilkinson, Samuel, 3,954,739.

Burt, Fairis S. Storm severity monitoring system. 3,955,192, Cl. 340-421.000.

Busch, Richard E., to Addmaster Corporation. Squeeze printer for papers or stacks of papers of varying thicknesses. 3,954,054, Cl. 101-93.10B.

Bushee, Harold R. Wood panel door. 3,953,951, Cl. 52-457.000.

Busler, William R.; and Robinson, Donald G., to Nalco Chemical Company. Prevention of subsurface seepage by acrylic acid polymers. 3,953,975, Cl. 61-1.00R.

Butler, William K.; and Anderson, Robert F., to General Signal Corporation. Fail-safe active timing circuit. 3,955,125, Cl. 317-141.00S.

Buu-Hoi, Nguyen Phuc; Lambelin, Georges E.; Roba, Joseph L.; Gillet, Claude; and Jacques, Guy D., to Continental Pharma. 1-(4-Alkylthiopheny)-2-substituted amino-alcohols and their salts. 3,954,871, Cl. 260-570.600.

Buuck, Robert E., to American Medical Systems, Inc. Penile erection system and methods of implanting and using same. 3,954,102, Cl. 128-79.000.

Byrnes, Robert M., Sr. Protective apron for use in meat processing plants. 3,953,893, Cl. 2-51.000.

C.A.V. Limited: *See*—
Ives, Andrew Peter; Hodgson, Duncan Barry; Buckle, Allan Stanley; and Halmshaw, Raymond Paul, 3,955,174.

C. G. Conn, Ltd.: *See*—
Southard, James S., 3,954,039.

Caldwell, Richard Lee: *See*—
Weber, Leonard J., 3,954,262.

California Institute of Technology: *See*—
Giffin, Charles E., 3,955,084.

Calistrat, Michael M., to Koppers Company, Inc. Permanently sealed gear coupling. 3,953,986, Cl. 64-9.00R.

Callahan, Francis J., Jr.; Gallagher, Bernard J.; Matousek, Stephen; and Koch, Ulrich H., to Whitey Research Tool Co. Fluid system device. 3,954,251, Cl. 251-288.000.

Camboulives, Andre A. M. L.; Le Maout, Theophile F.; and Vandenbroucke, Roger A. J., to Societe Nationale d'Etude et de Constructioin de Moteurs d'Aviation. Apparatus for controlling exhaust nozzle flaps. 3,954,225, Cl. 239-265.410.

Camp, Albert T.; and Csanady, Elmer R., to United States of America, Navy. High pressure-burning propellant composition. 3,954,533, Cl. 149-98.000.

Canevari, Roger: *See*—
Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignant, Jean-Claude, 3,954,765.

Canon Kabushiki Kaisha: *See*—
Hashimoto, Teiji, 3,955,206.
Sakaguchi, Keiichi; and Hirata, Noritsugu, 3,954,330.

Canto, Umberto, to Hankin, Max. Method and apparatus for removing dew from a green. 3,954,499, Cl. 134-6.000.

Carborundum Company, The: *See*—
Myles, Thomas A.; and Zimmer, Curtis E., 3,954,525.

Carew, Victor E.; and Carew, Victor E., Jr. Caliper type dimensional sensing devices and associated electronic mensuration, data processing and printout system. 3,955,073, Cl. 235-151.320.

Carew, Victor E., Jr: *See*—
Carew, Victor E.; and Carew, Victor E., Jr, 3,955,073.

Carlin, William W., to PPG Industries, Inc. Method of electrolysis of brine. 3,954,581, Cl. 204-128.000.

Carlson, Christian Raymond: *See*—
Hillyer, Michael John; and Carlson, Christian Raymond, 3,955,113.

Carlson, John A., to Conchemco, Incorporated. Leveling assembly. 3,954,241, Cl. 248-188.300.

Carmichael, Paul D.: *See*—
Pogonowski, Ivo C.; and Carmichael, Paul D., 3,954,610.

Carr, Scott. Mechanically actuated disc brake assembly. 3,954,160, Cl. 188-106.00F.

Carrano, Andrew J.; and Saferstein, Albert, to Codemark Industries, Inc. Aerial dart and paddle game. 3,954,266, Cl. 273-95.00R.

Carter, Dennis Ephraim. Thermocouples used for measuring temperatures. 3,954,507, Cl. 136-233.000.

Carter, Sidney T., to A-T-O Inc. Apparatus embodying continuous conveyors for applying labels to containers. 3,954,549, Cl. 156-486.000.

Case, Forrest N.; and McFarland, Clyde E., to United States of America, Energy Research and Development Administration. Method of tagging sand with ruthenium-103 and the resultant product. 3,954,655, Cl. 252-301.10R.

Casper, Robert F., to United States of America, Energy Research and Development Administration. Miniature electrical connector. 3,954,321, Cl. 339-177.00R.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See*—
Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, 3,954,782.
Ribka, Joachim; and Heinrich, Ernst, 3,954,396.

Cassella Farbwerke Mainkur Atiengesellschaft: *See*—
Schmalz, Wolfgang; Michel, Walter; and Schon, Manfred, 3,954,900.

Castle, Richard M., to Whittaker Corporation. Method of reclaiming cured polyurethane elastomers. 3,954,681, Cl. 260-2.300.

Castro, Roger Albert; Orman, Richard John; and Ryan, James Ernest, to Imperial Chemical Industries Limited. Method for simultaneously casting sheets on blocks of cellular polymeric material. 3,954,924, Cl. 264-41.000.

Cataldo, Roy S.: *See—*
Winchell, Frank J.; Irwin, Clarence C.; Mrlik, Jerry R.; and Cataldo, Roy S., 3,954,356.

Caterpillar Tractor Co.: *See—*
Cole, Carroll R.; Ferriell, Warren L.; Guhl, Richard E.; O'Neill, Frederick C.; and Sieving, Alfred W., 3,954,150.
Grawey, Charles E., 3,954,538.
Stedman, Robert N., 3,954,194.
Windish, Willis E., 3,954,028.

Cavalleri, Bruno; and Lancini, Giancarlo, to Gruppo Lepetit S.p.A. 2-Nitroimidazole derivatives. 3,954,789, Cl. 260-309.000.

Cavanagh, Joseph C.; Cromb, Michael D.; and Terner, Emanuel E., to Midland Glass Company. Glass container with plastic wrapper. 3,955,020, Cl. 428-35.000.

CCL Systems Limited: *See—*
Edwards, Hugh Jeremy Willis, 3,954,005.

Cecil, Olin B.; and Maycock, Paul D., to Texas Instruments Incorporated. Method of pulling silicon ribbon through shaping guide. 3,954,551, Cl. 156-608.000.

Celanese Corporation: *See—*
Ram, Michael J.; Rosenthal, Arnold J.; and Clarke, Charles M., 3,954,950.
Stackman, Robert W., 3,954,841.

Cengel, John A.: *See—*
Puskas, Imre; and Cengel, John A., 3,954,812.

Century Industries Corporation: *See—*
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Ceramic Systems: *See—*
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Ceres Products Company, Inc.: *See—*
Bowman, Benton O., 3,954,979.

Ceresa, Myron: *See—*
Shirk, Albert; and Ceresa, Myron, 3,954,570.

Ceske zavody motocyklove, narodni podnik: *See—*
Mraz, Vladimir, 3,954,021.

Ceskoslovenska akademie ved: *See—*
Barta, Cestmir; Liska, Oldrich; Louda, Jaroslav; Ryttnauer, Emil; and Zemlicka, Jan, 3,954,096.
Hrabak, Frantisek; and Vacek, Milos, 3,954,683.
Lim, Drahoslav; Sprincl, Ladislav; Kopecek, Jindrich; and Vacik, Jiri, 3,954,966.
Piskala, Alois; and Sorm, Frantisek, 3,954,752.

Chafetz, Harry: *See—*
Patmore, Edwin L.; Siegart, William R.; and Chafetz, Harry, 3,954,850.

Chamberlain, Robert E., to American Sterilizer Company. Load preheating and sterilizing method. 3,954,406, Cl. 21-57.000.

Chamberlain, Walter W., III, to Armstrong Cork Company. Method of making perforated vinyl film ceiling board. 3,954,540, Cl. 156-253.000.

Chambon, Rene, to S E B S.A. Hand held electric hair-dryer. 3,955,065, Cl. 219-371.000.

Champion International Corporation: *See—*
Vincent, David N.; and Chang, Cheng Hsiung, 3,954,803.

Chanel, Inc.: *See—*
Ostrowsky, Efrem M.; and Schepis, Anthony F., 3,954,201.

Chang, Cheng Hsiung: *See—*
Vincent, David N.; and Chang, Cheng Hsiung, 3,954,803.

Chang, Marguerite S.; Highby, John H.; and Mackenzie, Gerald L., to United States of America, Navy. Solid gas generating and gun propellant composition containing triaminoguanidine nitrate and synthetic polymer binder. 3,954,528, Cl. 149-19.400.

Chang, Wen-Hsuan; and Hartman, Marvis E., to PPG Industries, Inc. Extensible coatings. 3,954,899, Cl. 260-849.000.

Chao, Hung-Chi; Gross, John H.; Judd, Robert R.; and Rueckl, Roger L., to United States Steel Corporation. Process for the production of low apparent density water atomized steel powders. 3,954,461, Cl. 75-213.000.

Chapman, Earle F.; and Ruskin, Bernard J. Multiple position lamp. 3,955,079, Cl. 240-70.000.

Chas. A. Blatchford & Sons, Ltd.: *See—*
Thompson, Herbert, 3,953,900.

Chas. F. Thackray Limited: *See—*
Charnley, John, 3,953,899.

Charnley, John, to Chas. F. Thackray Limited. Knee arthroplasty. 3,953,899, Cl. 3-1.911.

Chemed Corporation: *See—*
Dewar, Norman Ellison; and Raziq, Said Ibrahim, 3,954,646.

Chemie Linz Aktiengesellschaft: *See—*
Rudorfer, Hermann; Wagner, Anton; Prammer, Franz; and Klausner, Friedrich, 3,954,449.

Chemische Werke Huls Aktiengesellschaft: *See—*
Brockhaus, Rudolf, 3,954,857.

Chen, Michael S.: *See—*
Block, Charles S.; Chen, Michael S.; and Noichl, Olaf J., 3,954,606.

Cheng, Chen-yen; and Cheng, Sing-Wang. Heat engine and heat pump utilizing a working medium undergoing solidification and melting operations. 3,953,973, Cl. 60-671.000.

Cheng, Sing-Wang: *See—*
Cheng, Chen-yen; and Cheng, Sing-Wang, 3,953,973.

Cherkofsky, Saul Carl, to Du Pont de Nemours, E. I., and Company. Mono-and disubstituted hydroxyguanidines in the treatment of depression. 3,954,995, Cl. 424-326.000.

Chernock, Stephen P. Spark wheels, method of manufacturing spark wheels, and dies for use therein. 3,953,996, Cl. 72-90.000.

Chesky, Sheldon R.; and Patience, Donald, to Colgate-Palmolive Company. Articulated sanitary napkin pad. 3,954,107, Cl. 128-290.00R.

Chevallet, Jacques; and Sausse, Andre, to Rhone-Poulenc, S.A. Vesical prosthesis. 3,953,897, Cl. 3-1.000.

Chevron Research Company: *See—*
Hotten, Bruce W., 3,954,918.
Lindquist, Robert H., 3,954,561.
Liston, Thomas V., 3,954,639.
Stayner, Robert A.; and Lowe, Warren, 3,954,494.
White, Robert J., 3,954,671.
Woo, Gar Lok, 3,954,685.

Chi, Chao S., to Digital Equipment Corporation. Zero crossing detecting circuit. 3,955,102, Cl. 307-235.00E.

Chiarino, Dario: *See—*
Teotino, Uberto; Della Bella, Davide; and Chiarino, Dario, 3,954,777.
Teotino, Uberto; Della Bella, Davide; and Chiarino, Dario, 3,954,778.

Chick, Robert K.; and Edwards, Ernest L., to Monsanto Company. Linearly disposed method and apparatus for orienting articles in a preselected end-to-end position. 3,954,171, Cl. 198-246.000.

Chihara, Yasuaki: *See—*
Muro, Tomio; Fukuzawa, Sogo; Chihara, Yasuaki; Nakao, Tohru; and Ogawa, Kiyoshi, 3,954,776.

Childers, Billy M.; and Fesperman, Charles D., Jr., to RCA Corporation. Diphenyl continuous foam dyeing with fabric running over rolls in foam bath. 3,954,404, Cl. 8-175.000.

Chinn, Leland J.: *See—*
Colton, Frank B.; and Chinn, Leland J., 3,954,844.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT.: *See—*
Knoll, Jozsef; Furst, Zsuzsanna; Meszaros, Zoltan; Szentmiklosi, Peter; David, Agoston; Hermecz, Istvan; Mandi, Attila; Bognar, Rezso; Makleit, Sandor; Valovics, Gyula; Szlavik, Laszlo; and Nagy, Sandor, 3,954,986.

Chiyoda Kako Kensetsu Kabushiki Kaisha: *See—*
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Chocholaty, Warren L., to International Business Machines Corporation. High voltage deflection electrode apparatus for ink jet. 3,955,203, Cl. 346-75.000.

Chozianin, Chris; and Oles, John G., to Kraftco Corporation. Emulsified oil dressings. 3,955,010, Cl. 426-605.000.

Christen, Urs; Pecsar, Raymond Ernest; and Wadsworth, Brent E., to Varian Associates. Automatic sampler apparatus. 3,954,012, Cl. 73-422.0GC.

Christensen, Charles R.: *See—*
Aleksoff, Carl C.; and Christensen, Charles R., 3,954,322.

Christidis, Yani, to Nobel Hoechst Chimie. Process of manufacture of polyhydric alcohol bromohydrins. 3,954,874, Cl. 260-584.00R.

Chromalloy American Corporation: *See—*
Gassman, Paul G.; and Gruetzmacher, Gordon D., 3,954,797.

Chua, Lye-Whatt, to U.S. Philips Corporation. Microwave hybrid network producing desired phase difference for use in Doppler radar systems. 3,955,194, Cl. 343-8.000.

Ciba-Geigy AG: *See—*
Ramanathan, Visvanathan, 3,954,398.

Ciba-Geigy Corporation: *See—*
Arya, Vishwa Prakash; and Nagarajan, Kuppuswamy, 3,954,757.
Dexter, Martin; and Steinberg, David Herbert, 3,954,839.
Fringeli, Werner, 3,954,740.
Geller, Leo; and Rittel, Werner, 3,954,975.
Habermeier, Jurgen, 3,954,790.
Jager, Horst, 3,954,817.
Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, 3,954,802.
Kuster, Werner, 3,954,796.
Lottanti, Guiseppe; Forster, Ewald; Lohse, Friedrich; and Schmid, Rolf, 3,954,712.
Papamichael, Stavros; and Dyer, Ross Mortimore Ward, 3,954,439.
Rasberger, Michael; Rody, Jean; Moser, Paul; and Mueller, Helmut, 3,954,708.
Smith, Malcolm John; and Randell, Donald Richard, 3,954,779.

Ciganek, Engelbert, to Du Pont de Nemours, E. I., and Company. N-cycloalkyl substituted-10,11-dihydro 5H-dibenzo[a,d] cycloheptene-5-imines. 3,954,865, Cl. 260-566.00R.

cincinnati Milacron, Inc.: *See—*
Bone, Kendall Frederick; and Johansson, Oskar Reinhold, 3,953,918.

Cinzori, Robert J.; and Ledbetter, Daniel R., to Hughes Aircraft Company. Passive infrared room intrusion detector. 3,955,184, Cl. 340-258.00B.

Cities Service Company: *See—*
Satterwhite, William A.; and Leach, Robert M., 3,954,953.

Clark Equipment Company: *See—*
Duttarer, Ralph M.; and Hushower, Richard R., 3,954,152.
Rittmann, Udo; and Wahnemuehl, Edgar, 3,954,026.

Clark, LaVerne W. Vibrating feeder device. 3,954,169, Cl. 198-220.0CA.

Clarke, Charles M.: *See—*
Ram, Michael J.; Rosenthal, Arnold J.; and Clarke, Charles M., 3,954,950.

Clavan, Walter: *See—*
Vidal, Frederick D.; Gerrity, Albert B.; and Clavan, Walter, 3,954,999.

Cleavenger Associates, Inc.: *See—*
Cleavenger, Thomas H., 3,955,021.

Cleavenger, Thomas H., to Cleavenger Associates, Inc. Meter box window cover. 3,955,021, Cl. 428-81.000.

Cleland, Robert L., to Manley Bros. of Indiana, Inc. Molding composition with resin coated refractory. 3,954,695, Cl. 260-38.000.

Cleron, Fernand: *See—*
Troesch, Andre; and Cleron, Fernand, 3,954,602.

Cleveland, James P., to Eastman Kodak Company. Synthesis of bis(2-substituted ethylthiomethyl) ethers. 3,954,878, Cl. 260-609.00R.

Clupak, Inc.: *See—*
Heim, Albert; and Baroni, Fausto, 3,954,557.

Coal Industry (Patents) Limited: *See—*
Browning, Eric John, 3,954,302.
Greenwood, Alan Norman, 3,955,132.
Hartley, Dennis, 3,954,299.

Coale, Harold D., to Phillips Petroleum Company. Poly(phenylene sulfide) containing mixtures and processes for producing free sintered parts therefrom. 3,954,932, Cl. 264-122.000.

Coatney, Richard L., to Kaiser Aluminum & Chemical Corporation. Plastically deformable magnesia. 3,954,488, Cl. 106-62.000.

Cockram, David Ralph, to Pilkington Brothers Limited. Coating compositions for glass fibres. 3,954,490, Cl. 106-99.000.

Codemark Industries, Inc.: *See—*
Carrano, Andrew J.; and Saferstein, Albert, 3,954,266.

Cohen, Amnon Mordechai, to Polak's Frutal Works N.V. Alicyclic ketoesters and process for their manufacture. 3,954,834, Cl. 260-468.00K.

Cohen, Jonathan Freddy: *See—*
Vofsi, David; Cohen, Jonathan Freddy; and Martan, Michael, 3,954,876.

Cole, Carroll R.; Ferriell, Warren L.; Guhl, Richard E.; O'Neill, Frederick C.; and Sieving, Alfred W., to Caterpillar Tractor Co. Vehicle roll protective structure. 3,954,150, Cl. 180-89.00R.

Colebourne, Neville; Rolfe, Nicholas; McAloon, Kevin Thomas; and Orton, Michael Leslie, to Imperial Chemical Industries Limited. Method of coating metal phosphates on organic polymeric substrates. 3,955,017, Cl. 427-383.000.

Colebrook, Ross W.; Strout, Frank G.; and Wright, Charles P., to Boeing Company, The. Jet noise suppressor. 3,954,224, Cl. 239-265.130.

Coleco Industries, Inc.: *See—*
Freeman, Richard; and Reiner, Norbert L., 3,954,267.

Colgate-Palmolive Company: *See—*
Bohrer, James Calvin; and Hewitt, Gordon Trent, 3,954,113.
Chesky, Sheldon R.; and Patience, Donald, 3,954,107.
Colodney, Daniel; and Cordon, Martin, 3,954,961.
Ferraro, Joseph George, 3,954,403.
Inamorato, Jack T.; and McDonnell, Robert W., 3,954,675.
Ramachandran, Pallassana, 3,954,630.
Taylor, Glenn N., 3,953,902.
Wixon, Harold Eugene, 3,954,679.

Collins, Christian James; and Stanley, Gilbert Frank, to Hawker Siddeley Dynamics Limited. Interferometric device for encoding shaft angles. 3,955,083, Cl. 250-231.0SE.

Collins, John D., to Raytheon Company. Single sideband generator of bi-level signals. 3,955,143, Cl. 325-137.000.

Colodney, Daniel; and Cordon, Martin, to Colgate-Palmolive Company. Dental polishing creams. 3,954,961, Cl. 424-49.000.

Colton, Frank B.; and Chinn, Leland J., to G. D. Searle & Co. (5Z,13E-,15S)-15-Hydroxy-11-oxoprosta-5,9,13-trien-1-oic acid and esters. 3,954,844, Cl. 260-488.00R.

Combe, Inc.: *See—*
Lapidus, Herbert, 3,954,393.

Comfort, Theodore F., to United States of America, Navy. Composite double base propellant composition containing ferric fluoride. 3,954,531, Cl. 149-38.000.

Commercial Solvents Corporation: *See—*
Kavka, Frank, 3,954,805.

Commissariat a l'Energie Atomique: *See—*
Delafosse, Jacques; and Viaud, Jean-Luc, 3,954,560.

Communications Satellite Corporation (Comsat): *See—*
Fleming, Paul Lawrence, 3,955,156.

Compagnie Generale des Etablissements Michelin: *See—*
Verdier, Henri, 3,954,130.

Comparini, Albert Anthony; and Gallo, John Joseph, to Bell Telephone Laboratories, Incorporated. Crystal resonator of (yzw)θ orientation having a thickness to width ratio of less than one. 3,955,109, Cl. 310-9.500.

Computervision Corporation, The: *See—*
Novak, Walter Thomas, 3,955,163.

Conair, Inc.: *See—*
Boring, Douglas James, 3,954,303.

Conchemco, Incorporated: *See—*
Carlson, John A., 3,954,241.

Congoleum Industries, Inc.: *See—*
Winters, Donald C., 3,955,030.

Conkling, William C., to Pennwalt Corporation. Ice free self-releasing water tank anode suspension system. 3,954,591, Cl. 204-196.000.

Consupak, Inc.: *See—*
Pollock, Donald M.; and Hallowell, Fulton W., 3,954,370.

Container Corporation of America: *See—*
Johnson, Prentice W., 3,954,221.

Continental Oil Company: *See—*
Kennedy, E. Flynt; and Weimer, Dean R., 3,954,660.
Napier, Donald R.; and Washecheck, Paul H., 3,954,664.
Romine, Hugh E., 3,954,798.

Continental Pharma: *See—*
Buu-Hoi, Nguyen Phuc; Lambelin, Georges E.; Roba, Joseph L.; Gillet, Claude; and Jacques, Guy D., 3,954,871.

Control Data Corporation: *See—*
Barbour, William P., 3,954,056.

Cook, Edward, Jr.; and Emery, Alvin T., to Hooker Chemicals & Plastics Corporation. Electrolytic method for the simultaneous manufacture of concentrated and dilute aqueous hydroxide solutions. 3,954,579, Cl. 204-98.000.

Cook, Raymon W., to Ray Cook Golf Putters, Inc. Golf club. 3,954,270, Cl. 273-164.000.

Coon, Clifford L., to United States of America, Army. Preparation of hexahydro-1,3,5-trialkanoyl-s-triazines. 3,954,750, Cl. 260-248.0NS.

Cooper, Charles Frank, to J. Tennant & Sons (Warrington) Limited. Burners. 3,954,387, Cl. 431-328.000.

Cooper, Daniel: *See—*
Dick, Donald E.; Cooper, Daniel; and Hileman, Ronald E., 3,954,098.

Corbin, Dean L. Rain guard for upwardly extending exhaust pipes. 3,954,290, Cl. 285-322.000.

Corcoran, Leo Francis: *See—*
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Cordon, Martin: *See—*
Colodney, Daniel; and Cordon, Martin, 3,954,961.

Corning Glass Works: *See—*
Seward, Thomas P., III; and Tick, Paul A., 3,954,485.

Cosden Oil & Chemical Company: *See—*
Watson, James M., 3,954,890.

Costin, Robert W., to Lear Siegler, Inc. Vehicle seat and support assembly therefor. 3,954,245, Cl. 248-400.000.

Cosyns, Jean; Martino, Germain; and Le Page, Jean-Francois, to Institut Francais du Petrole. New process for hydrogenating aromatic hydrocarbons on sulfur resistant catalysts. 3,954,601, Cl. 208-143.000.

Coutin, Pierre F.: *See—*
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Craig, Peter James: *See—*
Bradley, Basil John; Craig, Peter James; and Gammon, Geoffrey James, 3,954,698.

Craven, William E. Fruit picking apparatus. 3,953,960, Cl. 56-328.00R.

Crawford, Donald. Paint box and easel combination. 3,954,314, Cl. 312-231.000.

Criley, Ronald: *See—*
Frost, Richard H.; and Criley, Ronald, 3,954,234.

Critchlow, Ezra F.: *See—*
Strasburg, Richard N.; and Critchlow, Ezra F., 3,953,987.

Croix-Marie, Francis Jean-Marie; and Lebargy, Paul Aime, to Bertin & Cie. System of suspension and/or guidance for ground effect machine. 3,954,153, Cl. 180-124.000.

Cromb, Michael D.: *See—*
Cavanagh, Joseph C.; Cromb, Michael D.; and Terner, Emanuel E., 3,955,020.

Cronin, Francis J. Counter-rotating marine propulsion system. 3,954,084, Cl. 115-50.000.

Crooks, Donald D.: *See—*
Webster, Donald; and Crooks, Donald D., 3,954,514.

Cross, Barrington; and Grasso, Charles Paul, to American Cyanamid Company. (Alkynyloxy)alkyl and (alkenyloxy)alkyl carbamates and their use as herbicides. 3,954,441, Cl. 71-106.000.

Crowe, Curtis W.; and Baker, Bob D., to Dow Chemical Company, The. Acidizing fluid for stimulation of subterranean formations. 3,954,636, Cl. 252-8.55C.

Crowle, William G.: *See—*
Ostrowsky, Efrem M.; Crowle, William G.; and Hayes, Thomas H., 3,954,114.

Crowley, William L., Jr.: *See—*
Rode, France; Crowley, William L., Jr.; and Walker, Alexander D. R., 3,955,074.

Crump, Lloyd R. Radar randome antenna with switchable R.F. transparency/ reflectivity. 3,955,201, Cl. 343-701.000.

Csanady, Elmer R.: *See—*
Camp, Albert T.; and Csanady, Elmer R., 3,954,533.

Culmer, Daniel D.: *See—*
Russell, Ronald W.; and Culmer, Daniel D., 3,955,103.

Cummings, Percival W., Jr.; Goodman, John H., III; Glick, Arthur; McPherson, James B., Jr.; and McCusker, Edward J., to American Cyanamid Company. Polyglycolic acid fiber finish and method. 3,954,635, Cl. 252-8.900.

Cunningham, Alan: *See—*
Spoor, Joseph; and Cunningham, Alan, 3,954,720.

Cuntze, Ulrich: *See—*
Dollinger, Gustav; Cuntze, Ulrich; and Kleber, Rolf, 3,954,633.

Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, to Karl Kroyer St. Anne's Limited. Multi-ply paper and paperboard having a wet-laid ply and a dry-laid ply. 3,954,554, Cl. 162-104.000.

Curtin, Daniel J., to Atlantic Richfield Company. Method of removing contaminant from hydrocarbonaceous fluid. 3,954,603, Cl. 208-253.000.

Curtis, Daniel L.; Earls, John D.; and Fraker, Joseph E., Jr., to PPG Industries, Inc. Liquefaction of chlorine by multi-stage compression and cooling. 3,954,430, Cl. 62-23.000.

Cushing, Donald S.: *See—*
Guth, Lauren W.; and Cushing, Donald S., 3,954,116.

Czuba, Leonard J.: *See—*
Schaaf, Thomas K.; Czuba, Leonard J.; and Hess, Hans-Jurgen E., 3,954,741.

Czuha, Michael, Jr., to Du Pont de Nemours, E. I., and Company. Iridium thin ribbon electrodes for electrochemical cells. 3,954,590, Cl. 204-195.00W.

Dabringhausen, Friedhelm; and Neumaier, Heinrich, to Brown, Boveri & Cie. A.G. Electric switch. 3,955,057, Cl. 200-148.00A.

Dahlgren, Karl Gustav Lennart; and Kolosh, Frans Adam, to Berol Kemi AB. Compositions and process for the electroplating of metal or metal alloy coatings of high brightness on a base surface. 3,954,573, Cl. 204-43.00S.

Dahlin, Richard A., to Warner & Swasey Company, The. Grinding machine with energy absorbing breakage guard. 3,953,945, Cl. 51-269.000.

Daicel Ltd.: *See—*
Kudo, Teizo; Hashizume, Yoshio; Itoh, Masanori; and Shiga, Makoto, 3,954,903.

Daigle, Donald J.: *See—*
Reeves, Wilson A.; Donaldson, Darrell J.; Daigle, Donald J.; Drake, George L., Jr.; and Beninate, John V., 3,954,400.

Daimler-Benz Aktiengesellschaft: *See—*
Ehret, Fritz; Worner, Otto; and Juskowiak, Ulrich, 3,954,161.

Damon Corporation: *See—*
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Danepak Limited: *See—*
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Danneberg, Peter: *See—*
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Daskal, Elliot: *See—*
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David, Agoston: *See—*
Knoll, Jozsef; Furst, Zsuzsanna; Meszaros, Zoltan; Szentmiklosi, Peter; David, Agoston; Hermecz, Istvan; Mandi, Attila; Bognar, Rezso; Makleit, Sandor; Valovics, Gyula; Szlavik, Laszlo; and Nagy, Sandor, 3,954,986.

Davidson, Sidney Hayes, to Du Pont de Nemours, E. I., and Company. 2-Cyano-2-hydroxyiminoacetamides as plant disease control agents. 3,954,992, Cl. 424-287.000.

Davies, John R.: *See—*
Solomon, William H.; Davies, John R.; and Forward, Carrel M., 3,954,542.

Davies, Robert John; and Blows, Dennis George, to Foster Wheeler John Brown Boilers Limited. Waste treatment plants. 3,954,605, Cl. 210-7.000.

Davies, Terrence Ardern, to Square D Company. Electrical contact materials and methods of making the same. 3,954,456, Cl. 75-135.000.

Davis, Bryan Terence: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, 3,954,808.

Davis, Hugh J. Occlusion clip and instrument for applying same. 3,954,108, Cl. 128-325.000.

Davis, Robert: *See—*
Hutt, Thomas Gough; and Davis, Robert, 3,954,371.

Davis, Robert D.; Meyer, Theodore N.; and Blizzard, Roy L., to Plasmachem, Inc. Plasma method and apparatus for carrying out high temperature chemical reactions. 3,954,954, Cl. 423-492.000.

Davis, William A., Jr., to United States of America, Army. Missile guidance system using an injection laser active missile seeker. 3,954,228, Cl. 244-3.160.

Davitt, H. James, to Sun Oil Company of Pennsylvania. Vessel for extracting bitumen from tar sands. 3,954,415, Cl. 23-270.00R.

Davy Powergas GmbH: *See—*
Furkert, Herbert, 3,954,955.

Dean, Charles W. Method of storing aircraft. 3,954,197, Cl. 214-152.000.

deBlieck, Tom: *See—*
Abrahamsen, Theodorus Gerrit; and deBlieck, Tom, 3,954,122.

Decruyenaere, Trudo Marie Joseph. Header height control mechanism. 3,953,959, Cl. 56-208.000.

Deeg, Emil W.; and Graf, Robert E., to American Optical Corporation. Laser glasses with high damage threshold and method of making such glasses. 3,954,656, Cl. 252-301.40F.

Deena Packaging Industries, Inc.: *See—*
Warmath, John G., 3,954,179.

Deere & Company: *See—*
Becker, Reinhard, 3,954,204.
Hardesty, Lee Roy; and Sharpsteen, James Alfred, 3,954,089.
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Smemo, Alfred Sigmund, 3,954,146.

Deering Milliken Research Corporation: *See—*
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Defendorf, James C., to Bausch & Lomb Incorporated. Synchronous detector. 3,955,105, Cl. 307-261.000.

Deffenbaugh, Milton L.: *See—*
Barczynski, J. Robert; Deffenbaugh, Milton L.; Hedrick, Melvin R.; and Janssen, Jerry F., 3,954,470.

DEG Datensysteme und Electronic Gesellschaft Ingenieurbuero: *See—*
Wagner, Karlhorst; and Zorn, Hellmut, 3,955,129.

Delafosse, Jacques; and Viaud, Jean-Luc, to Commissariat a l'Energie Atomique. Nuclear fuel assembly. 3,954,560, Cl. 176-78.000.

Delalle, Jacques: *See—*
Rolland, Claude; and Delalle, Jacques, 3,953,916.

de Leon, Luis Espinosa: *See—*
Porth, Luis de la Pena; de Leon, Luis Espinosa; Delgado, Raymundo; and Perez, Tomas, 3,954,453.

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Della Bella, Davide: *See—*
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Teotino, Uberto; Della Bella, Davide; and Chiarino, Dario, 3,954,778.

Delzer, Dennis Richard, to Texas Instruments Incorporated. Radar RF generator including a stable local oscillator and an exciter circuit. 3,955,198, Cl. 343-17.700.

Dementiev, Valentin Matveevich: *See—*
Akhundov, Alizakir Alikhady Ogly; Kondukov, Nikolai Borisovich; Vorobiev, Kharlampy Sergeevich; Dementiev, Valentin Matveevich; Kuibyshev, Boris Solomonovich Farber; Zelenov, Alexei Alexandrovich; Logvinov, Vladimir Alexandrovich; Polinkovskaya, Anna Ilinichna; and Petrikhina, Galina Alexandrovna, 3,954,390.

Demetrio, Concetto Bruno; Apelbaum, Martin; and Tischio, Robert C., to Le Salon Bruno Demetrio Ltd. Hair styling iron having interchangeable heating tips. 3,955,064, Cl. 219-225.000.

deMey, Charles F., II: *See—*
Atwood, John G.; and deMey, Charles F., II, 3,954,339.

Deml, Reinhold: *See—*
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Dennilauler, Rene Jean; Pfaff, Maurice Edgar; and Roman, Pierre Amedee, to Eastman Kodak Company. Substituted phenoxy-3-chloro-malealdehydic acids. 3,954,853, Cl. 260-521.00H.

Densow, Ulrich O., to Outboard Marine Corporation. Centrifugal clutch with latch controlled engaging and releasing weight. 3,954,162, Cl. 192-105.0CE.

Derby, Howard, to GTE Laboratories Incorporated. High temperature thermocouple probe. 3,954,508, Cl. 136-233.000.

Deres, Janos: *See—*
Kompolthy, Tivadar; Bencz, Gyozo; and Deres, Janos, 3,954,532.

de Ridder, Jon A.: *See—*
Gunn, Walter H.; and de Ridder, Jon A., 3,954,510.

Desiderio, Fred A., to Rohm and Haas Company. Method for preparing dye solutions. 3,954,397, Cl. 8-41.00R.

Deuchar, Francis Warwick. Lever systems particularly useful for furniture. 3,954,195, Cl. 214-82.000.

Deucker, Walter; and Troster, Helmut, to Hoechst Aktiengesellschaft. Process for the preparation of 4-bromonaphthalic acid anhydride. 3,954,810, Cl. 260-345.200.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Lange, Ludwig; Diether, Jean; Volling, Axel; and Klebe, Hans, 3,954,945.
Osswald, Gunter; and Graf, Hans, 3,954,495.
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Deutsche Texaco Aktiengesellschaft: *See—*
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Devendorf, Don C.: *See—*
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Dewar, Norman Ellison; and Raziq, Said Ibrahim, to Chemed Corporation. Disinfectant composition and method. 3,954,646, Cl. 252-106.000.

Dexter, Martin; and Steinberg, David Herbert, to Ciba-Geigy Corporation. Hindered hydroxyphenylalkanoates of thioether isopropanols. 3,954,839, Cl. 260-473.00S.

Deyoe, Charles W.; Seib, Paul A.; and Hoseney, R. Carl, to Kansas State University Research Foundation. Preparation of l-ascorbate 2-sulfate from l-ascorbic acid. 3,954,809, Cl. 260-343.700.

Diamond Shamrock Corporation: *See—*
Adrian, Norman F.; and Fleming, Joseph P., 3,954,491.
Gunn, Walter H.; and de Ridder, Jon A., 3,954,510.

Dick, Donald E.; Cooper, Daniel; and Hileman, Ronald E. Synchronized multiple image tomographic cardiography. 3,954,098, Cl. 128-2.05Z.

Didchenko, Rostislav; and Amata, Charles D., to Union Carbide Corporation. Rapid stabilization of polyacrylonitrile fibers prior to carbonization. 3,954,947, Cl. 423-447.000.

Diebold, Incorporated: *See—*
Morello, Herbert; Mountford, George S.; and Keck, Richard E., 3,954,260.

Diehl: *See—*
Korner, Otto; and Spies, Klaus, 3,954,308.
Rudenauer, Werner; Weidner, Peter F.; and Stutzle, Dietmar, 3,954,061.

Dien, Chi K., to Allied Chemical Corporation. Copper phthalocyanine N-Di-N-butylaminoalkyl sulfonamide, quaternized solutions of the quaternary compound, and paper dyeing therewith. 3,954,392, Cl. 8-7.000.

Diether, Jean: *See—*
Lange, Ludwig; Diether, Jean; Volling, Axel; and Klebe, Hans, 3,954,945.

Di Gennaro, Gene A.: *See—*
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Digital Equipment Corporation: *See—*
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Di Ianni, Daniel: *See—*
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Dillard, Byron M.; Gilmer, Robert J.; and Kennedy, John D., to Owens-Illinois, Inc. Non-sulfur pulping process for corrugating medium using sodium carbonate and sodium hydroxide. 3,954,553, Cl. 162-90.000.

Dilly Mfg. Co., Inc.: *See—*
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Dipsol Chemicals Co., Ltd.: *See—*
Yanagida, Kazuo; Auki, Tethuzi; Takahashi, Akio; and Igarashi, Toshio, 3,954,575.

Dishal, Milton, to International Telephone and Telegraph Corporation. Feedback system for pulse transmitters. 3,955,144, Cl. 325-159.000.

DiToro, Michael J., to General Signal Corporation. System for audibly recognizing an aurally unclassifiable signal. 3,955,050, Cl. 179-1.0SA.

Dobbins, Walter James, to American Can Company. Apparatus for testing end closures. 3,954,003, Cl. 73-40.000.

Dobozy, Otto: *See—*
Vad, Janos; Bartha, Bela; Nadasy, Miklos; Dobozy, Otto; Mate, Ferenc; Kovacs, Miklos; Kolcsei, Marton; and Karacsonyi, Eva, nee Spindler, 3,954,436.

Dr. Ing. Rudolf Hell GmbH: *See—*
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Doi, Toru: *See—*
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Dolansky, Franz: *See—*
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Dolfini, Joseph Edward; and Bohme, Ekkehard, to E. R. Squibb & Sons, Inc. 7-Substituted cephalosporanic acid and derivatives thereof. 3,954,744, Cl. 260-243.00C.

Dollinger, Gustav; Cuntze, Ulrich; and Kleber, Rolf, to Hoechst Aktiengesellschaft. Antistatic and lubricating agents for th. processing of fibers. 3,954,633, Cl. 252-8.800.

Domaracki, John F.: *See—*
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Donaldson, Darrell J.: *See—*
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Donike, Manfred, to Macherey, Nagel & Company. Silyation agent for gas chromatography. 3,954,651, Cl. 252-182.000.

Dornier System GmbH: *See—*
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Dorr-Oliver Incorporated: *See—*
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Doub, Leonard; Kaltenbronn, James S.; and Schweiss, Dieter, to Parke, Davis & Company. Novel antibacterial amide compounds and process means for producing the same. 3,954,734, Cl. 260-239.100.

Douglas, James: *See—*
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Dover Corporation: *See—*
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Dow Chemical Company, The: *See—*
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Dunbar, Joseph E.; and Rogers, Joan H., 3,954,747.
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Hoenke, Guy A., 3,954,929.
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Smith, Hubert Stacy, Jr., 3,954,539.
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Dow Corning Corporation: *See—*
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Plueddemann, Edwin P., 3,955,036.

Downey, Raymond E., to Goodyear Tire & Rubber Company, The. Adhesive composition. 3,954,692, Cl. 260-33.6AQ.

Doxon, William E. Foldable bucksaw. 3,954,127, Cl. 145-32.00R.

Drake, George L., Jr.: *See—*
Frank, Arlen W.; and Drake, George L., Jr., 3,954,866.
Reeves, Wilson A.; Donaldson, Darrell J.; Daigle, Donald J.; Drake, George L., Jr.; and Beninate, John V., 3,954,400.

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Dreher, Karl D.; and Gogarty, William B., to Marathon Oil Company. Lamellar micelle containing compositions which exhibit retroviscous properties. 3,954,627, Cl. 252-8.50P.

Dreyer, Burkhardt: *See—*
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DSO "Pharmachim": *See—*
Toshkov, Toshko Sokolov; Gospodinov, Nikola Russev; and Vidimski, Evstati Penchev, 3,954,727.

Duckworth, Milton D., Jr. Aircraft lavatory drain plug. 3,954,123, Cl. 137-800.000.

Duffy, Michael Thomas, to RCA Corporation. Surface acoustic wave device. 3,955,160, Cl. 333-30.00R.

Dugan, William P.: *See—*
Vanderveer, Ramon D.; and Dugan, William P., 3,954,569.

Dugger, Harry A., to Sandoz, Inc. Apparatus and process for chromatographic product detection. 3,954,408, Cl. 23-230.0PC.

Duling, Irl N.; and Merges, John C., Jr., to Sun Ventures, Inc. Method of making porous objects of ultra high molecular weight polyethylene. 3,954,927, Cl. 264-49.000.

Dumas, Guy H., to Silec-Semi-Conducteurs. Synchronous control device for a static relay by a high frequency signal. 3,955,104, Cl. 307-252.0UA.

Dunbar, Joseph E.; and Rogers, Joan H., to Dow Chemical Company, The. Aminecarbotrithioates. 3,954,746, Cl. 260-247.10T.

Dunbar, Joseph E.; and Rogers, Joan H., to Dow Chemical Company, The. Aminecarbotrithioates and preparation. 3,954,747, Cl. 260-247.10T.

Dunlop, James Littlejohn; and Stevely, Robert Reid, to Imperial Chemical Industries Limited. Caseless propellant charges. 3,954,062, Cl. 102-99.000.

Du Pont de Nemours, E. I., and Company: *See—*
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Batzar, Kenneth, 3,954,496.
Bellina, Russell F., 3,954,837.
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Cherkofsky, Saul Carl, 3,954,995.
Ciganek, Engelbert, 3,954,865.
Czuba, Michael, Jr., 3,954,590.
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Echte, Adolf; Zizlsperger, Johann; Tetzlaff, Ernst; and Reffert, Rudi Wilhelm, to BASF Aktiengesellschaft. Manufacture of uniform polymers. 3,954,722, Cl. 526-68.000.

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Engle, Thomas, to General Signal Corporation. Emergency and handbrake control system. 3,954,304, Cl. 303-13.000.

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Flatau, Abraham, to United States of America, Army. Radio controlled wing rotor bomblet. 3,954,057, Cl. 102-3.000.
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Gadbois, George Simon; and Ragland, Frank Rowland, Jr., to RCA Corporation. Method and apparatus for determining the average size of apertures in an apertured member. 3,955,095, Cl. 250-550.000.

GAF Corporation: *See—*
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Gaskill, James R., Jr.; and Devendorf, Don C., to Hughes Aircraft Company. Diode controlled idle current injection. 3,955,099, Cl. 307-218.000.

Gassman, Paul G.; and Gruetzmacher, Gordon D., to Chromalloy American Corporation. Process for preparing azasulfonium halide salts. 3,954,797, Cl. 260-319.100.

Gates, Donald W.; Ratcliffe, Eldon S.; and Prochaska, David J., to Minnesota Mining and Manufacturing Company. Herbicidal composition. 3,954,437, Cl. 71-91.000.

Gautreaux, Marcelian F.; McCarthy, John H.; Foster, Walter E.; Hutchinson, Donald O.; and Frey, Frederick W., to Ethyl Corporation. Aluminum process. 3,954,443, Cl. 75-3.000.

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Gehrmann, Klaus; Erpenbach, Heinz; Kohl, Georg; and Kuebbeler, Hans Klaus, to Hoechst Aktiengesellschaft. Recovery of monomeric acrylic acid from residues originating from processed crude acrylic acid. 3,954,854, Cl. 260-526.00N.

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Giller, Solomon Aronovich; Zhuk, Regina Abramovna; and Berzinya, Anna Eduardovna. Process for producing N_1-(α-butyrolactone- and N_3(α-valerolactone)-5-substituted uracils. 3,954,760, Cl. 260-260.000.
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Gonner, Winfried Karl, to Bobensweewerk Perkin-Elmer & Co. GmbH. Reusable sealed coupling for glass tubes. 3,954,291, Cl. 285-341.000.
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Greene, Leonard M., to Safe Flight Instrument Corporation. Fixed beam radar with dual range light display providing both range and azimuth information. 3,955,195, Cl. 343-13.00R.
Greene, Robert I.; and Madigan, Thomas M., to Itek Corporation. Inked paper transport mechanism employing a pair of beveled rollers. 3,954,261, Cl. 271-188.000.
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Gyllenspetz, Jeffrey; and Renton, Stanley, to Albright & Wilson Limited. Trivalent chromium electroplating baths and electroplating therefrom. 3,954,574, Cl. 204-43.00T.

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Hamisch, Paul H., Jr.; and Karn, Donald L., to Monarch Marking Systems, Inc. Apparatus for printing and applying pressure sensitive labels. 3,954,545, Cl. 156-384.000.

Hammad, Mohamed W.: *See—*
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Hammer, Kurt Finn; Henderson, James Beattie; Lane, George William; Lauer, William; Luceyk, Alfred Robert; and Servas, Francis Martin, to Johnson & Johnson; and Purolator, Inc. Blood filtration unit. 3,954,623, Cl. 210-436.000.

Hamper, Hans; and Koch, Christian, to Siemens AG. Quick start device for reformed-gas generators. 3,954,423, Cl. 48-107.000.

Hamprecht, Gerhard: *See—*
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Hanamoto, Max M., to United States of America, Agriculture. Preparation of icings. 3,955,008, Cl. 426-572.000.

Hanaoka, Seiji, to Kabushiki Kaisha Suwa Seikosha. Parallel printer. 3,954,055, Cl. 101-99.000.

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Hand, William Westley. Wrap-around skirt for locker baskets. 3,954,312, Cl. 312-213.000.

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Hansel, Charles Edward Mark. Teaching machines. 3,953,929, Cl. 35-48.00R.

Harbarth, Martin; Steiner, Ewald; and Dolansky, Franz, to Siemens Altiengesellschaft. Cable raceway for electric lines. 3,954,237, Cl. 248-68.00R.

Hardesty, Edwin Charles, to Western Electric Company, Inc. Electrical connecting devices for terminating cords. 3,954,320, Cl. 339-99.00R.

Hardesty, Lee Roy; and Sharpsteen, James Alfred, to Deere & Company. Diesel engine. 3,954,089, Cl. 123-30.00C.

Hardouin, Jean-Claude Henri Raoul; and Vallette, Maurice Rene Jean, to Produits Chimiques Ugine Kuhlmann. Concentrated solution of a phosphate of a dyestuff of the Auramine series. 3,954,864, Cl. 260-566.90R.

Hargroves, Robert Arthur: *See—*
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Harley, David N., to ITW Limited. Fasteners. 3,954,295, Cl. 292-319.000.

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Harpenslager, Christiaan; and Ruhfus, Ulrich, to Gesellschaft fur Huttenwerksanlagen mbH; and Smitsvonk B.V. Flare burner for burning off combustible waste gases. 3,954,386, Cl. 431-285.000.

Harper, Philip M., to Boeing Company, The. Kneelable aircraft landing gear. 3,954,232, Cl. 244-102.00R.

Harrap, John; and Stewart, Richard Gordon, to Parks-Cramer (Great Britain), Ltd. Method and apparatus for spinning yarns on open-end spinning machines and pneumatically removing fiber and trash waste incident to spinning. 3,953,961, Cl. 57-56.000.

Harreis, Jobst: *See—*
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Harries, David Anthony: *See—*
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Harrigan, Roy M. Wind chill instrument. 3,954,007, Cl. 73-170.00R.

Harrington, John B.; and Waldner, Michael, to Hughes Aircraft Company. Adjustable frequency scanning signal processor. 3,955,137, Cl. 324-80.000.

Harshaw Chemical Company, The: *See—*
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Hartley, Dennis, to Coal Industry (Patents) Limited. Longwall mining machine with pivotal body adjustment. 3,954,299, Cl. 299-1.000.

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Hashimoto, Teiji, to Canon Kabushiki Kaisha. Single lens reflex camera for use with a miniature film cartridge. 3,955,206, Cl. 354-152.000.

Hashizume, Yoshio: *See—*
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Hasquenoph, Jean H.; and Coutin, Pierre F., to R. Alkan & Cie. Automatic hanging and wedging device for aircraft loads. 3,954,233, Cl. 244-137.00R.

Haswell, John W.; and Haswell, Stanley A. Means for making double groove pulleys. 3,953,995, Cl. 72-84.000.

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Hauni-Werke Koerber & Co. KG: *See—*
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Hawker Siddeley Dynamics Limited: *See—*
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Hayashi, Isao: *See—*
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Haytayan, Harry M. Nail carrying structures. 3,954,176, Cl. 206-347.000.

Hazan, Isidor; Iacona, Robert N.; and Nonemaker, Larry F., to Du Pont de Nemours, E. I., and Company. Electrocoating process for depositing a corrosion retardant layer on a metal substrate and sequentially electrocoating a cationic film-forming polymer coating. 3,954,588, Cl. 204-181.000.

Hazan, Isidor; and Iacona, Robert N., to Du Pont de Nemours, E. I., and Company. Aqueous electrocoating composition of the reaction product of an epoxy ester resin and a maleinized drying oil blended with a cross-linking agent. 3,954,688, Cl. 260-21.000.

Head, Donald E.: *See—*
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Heath, Walter I., to Parkland International Inc. Gas humidification system. 3,954,920, Cl. 261-104.000.

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Heim, Albert; and Baroni, Fausto, to Clupak, Inc. Perforated compactor bar. 3,954,557, Cl. 162-272.000.

Heim, Joseph R., to United States of America, Energy Research and Development Administration. Method of eliminating the training effect in superconducting coils by post-wind preload. 3,953,922, Cl. 29-602.00R.

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Helmuth, Gene R.; and Hughes, Harry N., to United States of America, Navy. Process for making a molded valve housing for a prosthetic limb. 3,954,931, Cl. 264-90.000.

Hemens, James Frederick, to Teleflex Limited. Motion transmitting systems. 3,954,022, Cl. 74-496.000.

Hemming, Raymond Charles; and Ball, Quentin R., to Northern Electric Company Limited. Telephone housing having interchangeable dial face inserts. 3,955,054, Cl. 179-100.00D.

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Hendrich, John H. Foldable building module. 3,953,947, Cl. 52-70.000.

Hendrick, Robert P. Recovery of hydrocarbons by in situ thermal extraction. 3,954,140, Cl. 166-272.000.

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Hennel, Geoffrey Frank; and Tappin, Robert Henry, to Plessey Handel und Investments A.G. Mounting of optical fibres or other filaments in axial alignment with one another or with other elements. 3,954,338, Cl. 356-138.000.

Hennessy, Douglas J. 1-(2-Propynyl)-1 H-indazole compounds. 3,954,793, Cl. 260-310.00C.

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Hepp, Wolfgang; Pimiskern, Klaus; and Herbert, Werner, to Dornier System GmbH. Process for producing grooves in metallic bodies. 3,954,582, Cl. 204-129.650.

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Herzog, Paul; and Herzog-Thomander, Karin. Disinfectant for the surface of human body parts containing hydrogen peroxide. 3,954,974, Cl. 424-130.000.

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Hunter, Don L.; Smith, Robert A.; and Belles, Wayne S., to United States Borax & Chemical Corporation. 5-Trifluoromethyl-7-aminobenzimidazoles herbicides. 3,954,438, Cl. 71-92.000.
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Ives, Donald Charles Alfred; and Harwood, Gerald, to Danepak Limited. Triple track bacon packing line. 3,954,166, Cl. 198-39.000.

Iwamoto, Mitsuru; and Tanaka, Toshie, to Nishiei Bussan Co., Ltd.; and Nifco Inc. Plastic sealing device. 3,954,294, Cl. 292-318.000.

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Jackson, Julius, to Du Pont de Nemours, E. I., and Company. Process for preparing pigmentary β-copper phthalocyanine. 3,954,795, Cl. 260-314.500.

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Jahn, Walter, to Jenaer Glaswerk Schott & Gen. High-temperature and wear-resistant antifriction material having low thermal expansions. 3,954,479, Cl. 106-52.000.

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Jenn, Louis J., to Jenn Air Corporation. Ventilation and filter module for cooking units. 3,954,427, Cl. 55-217.000.

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Johnson, Bremen I.: *See—*
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Jones, John A.; MacPhail, Alexander C. B.; Milne, Charles B.; and Riches, Kenneth M., to Shell Oil Company. Storage-stable grease compositions. 3,954,638, Cl. 252-40.000.

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Jones, Kenneth James; and Hargroves, Robert Arthur, to Lucas Electrical Company Limited, The. Lamp reflectors and motor vehicle lamp assemblies incorporating same. 3,955,077, Cl. 240-41.300.
Jones, Raymond Henry: *See—*
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Jorgenson, Morris E.; Sheldon, Paul B.; Sherman, Jack A.; and Wardell, Peter S. Electric kettle spout flap. 3,954,203, Cl. 220-334.000.
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Jurgensen, Heinrich, to Dr. Ing. Rudolf Hell GmbH. Circuit for digitally controlling the brightness of the electron beam of an electron beam deflection tube. 3,955,120, Cl. 315-385.000.
Jurisch, Wilhelm, to Motoren- und Turbinen-Union Munchen GmbH. Apparatus and method for governing speed and acceleration of a gas turbine system. 3,953,968, Cl. 60-39.28R.
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Kalopissis, Gregoire; and Vanlerberghe, Guy, to L'Oreal. Non-ionic surface-active agents derived from fatty chain diols. 3,954,882, Cl. 260-613.00B.
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Labovitz, Jeffery N.; and Henrick, Clive A., to Zoecon Corporation. Synthesis of non-4-en-6-ynoic acid ester. 3,954,818, Cl. 260-410.90R.
Lagally, Paul, to United States of America, Navy. Low density foam resin composite of high stiffness. 3,954,686, Cl. 260-2.5AK.
Lagow, Richard J.; Gerchman, Lois L.; and Jacob, Robert A., to Massachusetts Institute of Technology. Synthesis of trifluoromethyl-substituted compounds. 3,954,585, Cl. 204-165.000.
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Lambregts, Antonius A., to Boeing Company, The. Windshear detection system. 3,955,071, Cl. 235-150.200.
Lamparsky, Dietmar: *See—*
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Lange, Ludwig; Diether, Jean; Volling, Axel; and Klebe, Hans, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of finely divided oxides. 3,954,945, Cl. 423-336.000.
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Lapidus, Herbert, to Combe, Inc. Hair dyeing composition containing bismuth citrate, triethanolamine and sulfur. 3,954,393, Cl. 8-10.100.
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Lawrence, James Rogers; and Yates, Chester R., to Steadley Company, Inc. Spring unit support and assembly. 3,953,903, Cl. 5-267.000.
Lawson, James R., to Texas Instruments Incorporated. Self-aligning photoresist process for selectively opening tops of mesas in mesa-diode-array structures. 3,954,524, Cl. 148-187.000.
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Logan, James D.: *See—*
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Loken, Per A., to Myrens Verksted A/S. Process and apparatus for the incineration of aqueous sewage sludge. 3,954,069, Cl. 110-8.00R.

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Lombardino, Joseph G.: *See—*
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Lowe, Orville G. Oxidation of thiols to disulfides. 3,954,800, Cl. 260-327.00R.

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Lu, Chin H.; and Allen, David A., to Xerox Corporation. Electrostatic printing inks. 3,954,640, Cl. 252-62.10L.

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Luchetta, Julius Frank, to Litton Systems, Inc. Electrical apparatus and method for reducing power consumption of a fluorescent lamp system. 3,954,316, Cl. 315-96.000.

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Luscombe, Randal. Unloading and shut-off door. 3,954,210, Cl. 222-561.000.

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Lyon, David L.; Holsinger, Jerry L.; and Williams, David E., to Intertel, Inc. Synchronizing circuit for modems in a data communications network. 3,955,141, Cl. 325-38.00A.

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Eppensteiner, Frederick Walter; and Woehrle, R. E., 3,954,571.

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Macherey, Nagel & Company: *See—*
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Macrowave Development Laboratories, Inc.: *See—*
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Mader, Helmut: *See—*
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Magdo, Ingrid E.; Magdo, Steven; and Nestork, William J., to International Business Machines Corporation. Process for fabricating devices having dielectric isolation utilizing anodic treatment and selective oxidation. 3,954,523, Cl. 148-175.000.

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Magolan, Angeline R. Liniment. 3,954,978, Cl. 424-195.000.

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Maki, Masaharu: *See—*
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Makitalo, Valto Johannes; Lilja, Launo Leo; and Fugleberg, Sigmund Peder, to Outokumpu-Oy. Process for separating Cd from Zn by cementation. 3,954,452, Cl. 75-109.000.

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Malagari, Frank A., Jr., to Allegheny Ludlum Industries, Inc. Method of producing grain oriented silicon steel. 3,954,521, Cl. 148-111.000.

Mall, Gunther; and Willenbacher, Erich, to Pfaff Industriemaschinen GmbH, Firma. Sewing machine having top and bottom feed synchronizing means. 3,954,071, Cl. 112-207.000.

Mandi, Attila: *See—*
Knoll, Jozsef; Furst, Zsuzsanna; Meszaros, Zoltan; Szentmiklosi, Peter; David, Agoston; Hermecz, Istvan; Mandi, Attila; Bognar, Rezso; Makleit, Sandor; Valovics, Gyula; Szlavik, Laszlo; and Nagy, Sandor, 3,954,986.

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Mangin, Pierre M.: *See—*
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Mangum, Grafton F.; Rogers, Rudy E.; and Schreck, Edward J., to Thiokol Corporation. Method for making coated ultra-fine ammonium perchlorate particles and product produced thereby. 3,954,526, Cl. 149-7.000.

Manitowoc Company, Inc., The: *See—*
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Manley Bros. of Indiana, Inc.: *See—*
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Mannesmann Aktiengesellschaft: *See—*
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Manske, Hans E., to Zenith Radio Corporation. Color television with VRT and automatic degaussing. 3,955,115, Cl. 315-8.000.

Manske, Wendell J., to Minnesota Mining and Manufacturing Company. Selected time interval indicating device. 3,954,011, Cl. 73-356.000.

Marathon Oil Company: *See—*
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Marecaux, Paul, to Societe Pour l'Equipement des Industries Chimiques Speichim. Method of and apparatus for incinerating an aqueous solution containing nitro compounds. 3,954,381, Cl. 431-2.000.

Margetts, Hugh Grenville, to Girling Limited. Brake slack adjusters. 3,954,159, Cl. 188-196.00D.

Margotte, Dieter; Ott, Karl-Heinz; Schirmer, Hermann; Kampf, Gunther; Peilstocker, Gunter; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Moulding composition of a polycarbonate, a graft copolymer and a copolymer and moulded articles therefrom. 3,954,905, Cl. 260-873.000.

Margotte, Dieter: *See—*
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Marie, Georges R. P. Ring laser for penetrating waves. 3,955,153, Cl. 331-94.50C.

Marion Laboratories, Inc.: *See—*
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Markley, Lowell D., to Dow Chemical Company, The. Substituted 2-hydroxy-2-phenylbutylsulfonate compounds. 3,954,440, Cl. 71-103.000.

Marple, Virgil A.; and Whitby, Kenneth T., to United States of America, Interior. Precision aerosol divider. 3,954,428, Cl. 55-270.000.

Marquez, Joseph A.: *See—*
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Marquisee, Mark James; and Prichard, William W., to Du Pont de Nemours, E. I., and Company. Semipermeable microcapsules containing heterogeneous catalysts and ferromagnetic materials. 3,954,666, Cl. 252-430.000.

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Marsden, Winston Anthony, to Australian Wire Industries Proprietary Limited. Concrete reinforcing elements and reinforced composite incorporating same. 3,953,953, Cl. 52-659.000.

Marshall, Nicholas James: *See—*
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Marshall, Robert Moore; and Scott, John Irving, to Allied Chemical Corporation. Spin finish for textured carpet yarn. 3,954,631, Cl. 252-8.700.

Martan, Michael: *See—*
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Martin, Frederick Raymond Patrick, to Lucas Electrical Company Limited. Motor vehicle with headlamp tilting mechanism. 3,955,080, Cl. 240-7.1LJ.

Martin, Frederick Raymond Patrick, to Lucas Electrical Company Limited, The. Motor vehicle with headlamp tilting mechanism. 3,955,173, Cl. 240-7.1LJ.

Martin, Lendell, Sr., to East Houston Air Conditioning, Inc. Plenum starter piece. 3,954,289, Cl. 285-158.000.

Martino, Germain: *See—*
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Martinsson, Eva Margareta; and Hellsten, Karl Martin Edvin, to Modokemi Aktiebolag. Synthetic detergents of the ampholytic betaine type, process for preparing the same and compositions. 3,954,845, Cl. 260-501.130.

Martz, Lyle F.; and Plotnick, Richard J., to Westinghouse Electric Corporation. Combined cycle electric power plant having a control system which enables dry steam generator operation during gas turbine operation. 3,953,966, Cl. 60-39.020.

Maruyama, Tetsuo; Mikami, Iwao; and Imaoka, Kazuo, to Takeda Chemical Industries, Ltd. Method for producing pyrimidine. 3,954,756, Cl. 260-256.40N.

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Mathison, Ian William; Solomons, William Ebenezer; and Jones, Raymond Henry, to Marion Laboratories, Inc. N-substituted-7,8-dihydroxycyclopentano[f]-1,2,3,4-tetrahydroisoquinolines and ethers and esters thereof. 3,954,774, Cl. 260-287.0CF.

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Munk, Edmund E., to Werzalit-Pressholzwerk J.F. Werz Jr. KG. Apparatus for making molded bodies from ligno-cellulose particles. 3,954,376, Cl. 425-412.000.
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Muro, Tomio; Fukuzawa, Sogo; Chihara, Yasuaki; Nakao, Tohru; and Ogawa, Kiyoshi, to Yoshitomi Pharmeceutical Industries, Ltd. 1-[Methylated piperidino(and pyrrolidin-1-yl)]-3-(substituted phenoxy)-2propanols. 3,954,776, Cl. 260-293.670.

Murray, Coyt E. Reinforced extruder for high molecular weight polyethylene. 3,954,372, Cl. 425-378.00R.

Musgrove, Earl E. Wheel assembly for supporting an endless resilient belt for picking cotton off the ground. 3,954,017, Cl. 74-230.400.

Myles, Thomas A.; and Zimmer, Curtis E., to Carborundum Company, The. Hot-pressed solid diffusion sources for phosphorus. 3,954,525, Cl. 148-189.000.

Myrens Verksted A/S: *See—*
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Nagahara, Shusaku: *See—*
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Najer, Henry: *See—*
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Nakabe, Sanai, to Sumitomo Metal Mining Co. Limited. Process for recovering cobalt, copper, iron, nickel and arsenic. 3,954,448, Cl. 75-82.000.

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Nakama, Daiji, to Nifco Inc. Coupling mechanism. 3,954,344, Cl. 403-14.000.

Nakamura, Junichi; and Ogawa, Masao, to Showa Denko Kabushiki Kaisha. Flame retardant resin composition comprising an acrylonitrile-styrene base terpolymer, a different acrylonitrile-styrene-chlorinated polyethylene terpolymer and antimony trioxide. 3,954,908, Cl. 260-876.00R.

Nakao, Tohru: *See—*
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Nakaoka, Eiichi, to Shimadzu Seisakusho Ltd. Apparatus for automatically detecting and eliminating flaws on slabs or billets. 3,953,943, Cl. 51-34.00E.

Nakashio, Seizo; Tsuji, Kozo; Toyota, Nobuhiro; Fukita, Fumio; and Oyamada, Takeo, to Sumitomo Chemical Company, Limited; and Hayashibara Biochemical Laboratories, Inc. Process for preparing aqueous dispersions of high polymer using pullulan as a dispersant. 3,954,724, Cl. 526-200.000.

Nakashita, Mitsuo: *See—*
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Napier, Donald R.; and Washecheck, Paul H., to Continental Oil Company. Addition polymerization process. 3,954,664, Cl. 252-429.00R.

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Nebolsine, Rostislav, to Hydrotechnic Corporation. Filtration and backwashing apparatus for use with a water filtration system. 3,954,620, Cl. 210-275.000.

Nedenskov, Poul; and Alster, Karol, to Aktieselskabet Grindstedvaerket. Furane derivatives and production thereof. 3,954,813, Cl. 260-347.300.

Nemoto, Yoshio; Funahashi, Hiroyuki; and Miyake, Takeo, to Sumitomo Chemical Company, Limited. Process for dyeing nitrogen-containing fibers. 3,954,399, Cl. 8-54.000.

Neros, Clifford A.; and Ward, Robert A., to Anscott Chemical Industries, Inc. Industrial drycleaning detergent. 3,954,647, Cl. 252-153.000.

Nesbit, Glenn S. Drive arrangement for motorcycles and the like. 3,954,145, Cl. 180-33.00C.

Nestork, William J.: *See—*
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Newby, Gordon L. Method for forming uniform mold changes including severing a milled and stretched elastomeric material. 3,954,934, Cl. 264-146.000.

Newton, Albert E., to USM Corporation. Fulcrum type can opener. 3,954,030, Cl. 81-3.46R.

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Nicol, Ronald, to Heinemann Electric Company. Electromagnetic circuit breaker with electrical and mechanical trip indication. 3,955,162, Cl. 335-17.000.

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Ohlschlager, Hans; and Riester, Oskar, to AGFA-Gevaert, A.G. Light-sensitive photographic material containing a supersensitized silver halide emulsion layer. 3,954,481, Cl. 96-122.000.
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Ram, Michael J.; Rosenthal, Arnold J.; and Clarke, Charles M., to Celanese Corporation. Production of high tenacity graphitic fibrous materials. 3,954,950, Cl. 423-447.000.
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Schmidt, Werner: *See—*
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Schmit, Joseph L.; and Scott, M. Walter, to Honeywell Inc. Method for reducing compositional gradients in mercury cadmium telluride. 3,954,518, Cl. 148-20.300.

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Schmutzer, Joel J.: *See—*
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Schober, Donald L., to Union Carbide Corporation. Composition with selected vinyl compounds and process for avoiding scorching of ethylene polymer composition. 3,954,907, Cl. 260-875.000.

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Schroder, Dierk; and Grunberg, Dieter, to BBC Brown Boveri & Company Limited. Apparatus for stabilization of electrical power supply mains. 3,955,133, Cl. 323-50.000.

Schroeder, Allen G.: *See—*
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Schuman, Paul D.; Tarrant, Paul; Warner, Dale A.; and Westmoreland, Geraldine, to PCR, Inc. Process for fluorinating uracil and derivatives thereof. 3,954,758, Cl. 260-260.000.

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Schwab, Frederick C.; and Heilweil, Israel J., to Mobil Oil Corporation. Block copolymers of hydrogenated diene-styrene with polymerized alkylene oxide and alkylene sulfide. 3,954,915, Cl. 260-887.000.

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Scifres, Donald R.; and Burnham, Robert D., to Xerox Corporation. Method of forming light emitting diode array with dome geometry. 3,954,534, Cl. 156-7.000.

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Sedelmayer, Franz X. Lift truck for vehicles. 3,954,198, Cl. 214-333.000.

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Self, Richard E. High energy loss nested sleeve fluid control device. 3,954,124, Cl. 138-42.000.

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Fischer, Peter; Hagen, Wilhelm; Klappert, Helmut; Levin, Walter; Zenner, Karl-Friedrich; and Werneburg, Johannes, 3,954,567.

Zentralinstitut fur Schweisstechnik der Deutschen Demokratischen Republik: *See*—
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Zhimerin, Dmitry Georgievich: *See*—
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Ziegler, Gunther; Lanig, Peter; Schmidt, Erwin; and Frohmader, Sigrun, to Siemens AG. Method of manufacturing an intermetallic superconductor. 3,954,572, Cl. 204-37.00T.

Ziehl, Herbert E., to General Motors Corporation. Air pump pivot pin restraint. 3,954,357, Cl. 418-138.000.

Ziemba, Richard T., to General Electric Company. Presettable counter. 3,955,069, Cl. 235-92.0PE.

Zimmer, Curtis E.: *See*—
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Zimmerer, Arthur L.; Zimmerer, Bernard J.; and Zimmerer, Paul B., to Lindsay Manufacturing Co. Gear box. 3,954,120, Cl. 137-344.000.

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Zimmermann, Robert E., to Koppers Company, Inc. Metallurgical furnace. 3,954,254, Cl. 266-188.000.

Zizlsperger, Johann: *See*—
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Zocher, Josef, to Singer Company, The. Needles for tufting or the like. 3,954,072, Cl. 112-222.000.

Zoecon Corporation: *See*—
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Zorn, H.: *See*—
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Zyla, Gregory J. Drag racing game apparatus. 3,954,268, Cl. 273-134.0CA.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 4TH DAY OF MAY, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687.

Benson, Nigel C., and R. A. Hodgkins, to Imperial Chemical Industries Ltd. Web winding apparatus. T946,008, 5-4-76, Cl. 242—56.

Berkebile, David H. Mold and method of thermoforming using such mold. T946,002, 5-4-76, Cl. 425—388.

Coogan, Joseph F.: *See*—
Stefanucci, Arthur, Harnisch, Stevens, and Coogan. T946,010.

Fontanarosa, Patsy R., E. P. Hecker, and C. G. Metreaud, to International Business Machines Corp. Float contracting process and apparatus. T946,003, 5-4-76, Cl. 134—3.

Harnisch, Douglas R.: *See*—
Stefanucci, Arthur, Harnisch, Stevens, and Coogan. T946,010.

Hecker, Edward P.: *See*—
Fontanarosa, Patsy R., Hecker, and Metreaud. T946,003.

Hodgkins, Roger A.: *See*—
Benson, Nigel C., and Hodgkins. T946,008.

Imperial Chemical Industries Ltd.: *See*—
Benson, Nigel C., and Hodgkins. T946,008.
Kelly, Roger S. A., and Wilson. T946,006.
Kelly, Roger S. A., and Wilson. T946,007.
Smith, Clive P. T946,009.

Intermountain Research & Development Corp.: *See*—
Smith, William D., Waggener, and Huddleston. T946,005.

International Business Machines Corp.: *See*—
Fontanarosa, Patsy R., Hecker, and Metreaud. T946,003.
Page, Josiah B. T946,001.

Kelly, Roger S. A., and J. R. Wilson, to Imperial Chemical Industries Ltd. Process for coating films. T946,006, 5-4-76, Cl. 428—129.

Kelly, Roger S. A., and J. R. Wilson, to Imperial Chemical Industries Ltd. Process for coating films. T946,007, 5-4-76, Cl. 428—483.

Leinum, Floyd D.: *See*—
McClure, Harold E., and Leinum. T946,011.

McClure, Harold E., and F. D. Leinum, to Thermo King Corp. Fuel/air separation system for diesel engines. T946,011, 5-4-76, Cl. 137—565.

Metreaud, Claude G.: *See*—
Fontanarosa, Patsy R., Hecker, and Metreaud. T946,003.

Page, Josiah B., to International Business Machines Corp. Performance driven workload manager. T946,001, 5-4-76, Cl. 444—1.

Seifer, David A. Camera viewfinder with indicator. T946,004, 5-4-76, Cl. 354—53.

Smith, Clive P., to Imperial Chemical Industries Ltd. Polyester composition. T946,009, 5-4-76, Cl. 260—40.

Smith, William D., R. W. Waggener, and G. J. Huddleston, to Intermountain Research & Development Corp. Production of sodium carbonate. T946,005, 5-4-76, Cl. 423—206.

Stefanucci, Arthur, D. R. Harnisch, G. W. Stevens, and J. F. Coogan. Process for a roasted and ground coffee product. T946,010, 5-4-76, Cl. 426—418.

Thermo King Corp.: *See*—
McClure, Harold E., and Leinum. T946,011.
Willis, Leonard L. T946,012.

Waggener, Richard W.: *See*—
Smith, William D., Waggener, and Huddleston. T946,005.

Willis, Leonard L., to Thermo King Corp. Gas compressor valve arrangement with improved wear resistance. T946,012, 5-4-76, Cl. 417—550.

Wilson, John R.: *See*—
Kelly, Roger S. A., and Wilson. T946,006.
Kelly, Roger S. A., and Wilson. T946,007.

LIST OF REISSUE PATENTEES

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PATENTS WERE ISSUED ON THE 4TH DAY OF MAY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Acker, Jesse L.; and Meserol, Peter M., to Akro-Medic Engineering, Inc. Apparatus for evaluation of biological fluid. Re. 28,800, Cl. 356-201.000.

Acker, Jesse L.; and Meserol, Peter M., to Akro-Medic Engineering, Inc. Apparatus for evaluation of biological fluid. Re. 28,801, Cl. 356-201.000.

Akro-Medic Engineering, Inc.: *See*—
Acker, Jesse L.; and Meserol, Peter M., Re. 28,800.
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American Monitor Corporation: *See*—
Durkos, Larry George; Cole, Robert Wayne; and Denney, Jerry William, Re. 28,803.

Bert, Stephen F., to Textron Inc. End attachment for watch band and self-contained component for use in making the same. Re. 28,793, Cl. 24-265.00B.

Brewer, Clarence T., to Solo Cup Company. Lid. Re. 28,797, Cl. 220-306.000.

Burroughs Corporation: *See*—
Hennessey, William M.; and Schorno, Hector R., Re. 28,799.

Cole, Robert Wayne: *See*—
Durkos, Larry George; Cole, Robert Wayne; and Denney, Jerry William, Re. 28,803.

Denney, Jerry William: *See*—
Durkos, Larry George; Cole, Robert Wayne; and Denney, Jerry William, Re. 28,803.

Draugelis, Vaidevutis C.; Tsilibes, George N.; and Vineski, John E., to Xerox Corporation. Fusing apparatus. Re. 28,802, Cl. 219-216.000.

Durkos, Larry George; Cole, Robert Wayne; and Denney, Jerry William, to American Monitor Corporation. Method and electronic control for the analyzation of serum chemistries. Re. 28,803, Cl. 235-151.300.

Fuchs, Francis Joseph, Jr., to Western Electric Company, Inc. Apparatus and method for continuous extrusion. Re. 28,795, Cl. 72-60.000.

Gomi, Yoshifumi: *See*—
Shimodaira, Takayoshi; and Gomi, Yoshifumi, Re. 28,796.

Hennessey, William M.; and Schorno, Hector R., to Burroughs Corporation. Mounting bracket for display panel. Re. 28,799, Cl. 339-65.000.

Herring, Carl Richard; and Schneider, Fred John, to Western Electric Co., Inc. Methods of and apparatus for aligning and bonding workpieces. Re. 28,798, Cl. 228-5.500.

Kabushiki Kaisha Suwa Seikosha: *See*—
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Meserol, Peter M.: *See*—
Acker, Jesse L.; and Meserol, Peter M., Re. 28,800.
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Sardo, Vincent, Jr. Seat belt system for automotive vehicles. Re. 28,804, Cl. 340-52.00E.

Schneider, Fred John: *See*—
Herring, Carl Richard; and Schneider, Fred John, Re. 28,798.

Schorno, Hector R.: *See*—
Hennessey, William M.; and Schorno, Hector R., Re. 28,799.

Shimodaira, Takayoshi; and Gomi, Yoshifumi, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Compact flying printer. Re. 28,796, Cl. 101-93.310.

Shinshu Seiki Kabushiki Kaisha: *See*—
Shimodaira, Takayoshi; and Gomi, Yoshifumi, Re. 28,796.

Solo Cup Company: *See*—
Brewer, Clarence T., Re. 28,797.

Textron Inc.: *See*—
Bert, Stephen F., Re. 28,793.

Tilse, Wilhelm, to Timex Corporation. Balance wheel. Re. 28,794, Cl. 58-107.000.

Timex Corporation: *See*—
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Tsilibes, George N.: *See*—
Draugelis, Vaidevutis C.; Tsilibes, George N.; and Vineski, John E., Re. 28,802.

Vineski, John E.: *See*—
Draugelis, Vaidevutis C.; Tsilibes, George N.; and Vineski, John E., Re. 28,802.

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Draugelis, Vaidevutis C.; Tsilibes, George N.; and Vineski, John E., Re. 28,802.

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Bull, Norbert, to Mikkelsens, Inc. Kalanchoe plant. 3,880, 5-4-76, Cl. 68.
James, George, to James Pecan Farms, Inc. Hican tree. 3,877, 5-4-76, Cl. 30.
James Pecan Farms, Inc.: *See*—
James, George. 3,877.
Mikkelsens, Inc.: *See*—
Bull, Norbert. 3,880.
Moore, Ralph S. Miniature rose plant. 3,876, 5-4-76, Cl. 7.
Olsson, Folke S. Xylosma plant. 3,879, 5-4-76, Cl. 54.
Saels, Edwin. Variety of apples. 3,878, 5-4-76, Cl. 34.

LIST OF DESIGN PATENTEES

ABM-Mavello AB: *See*—
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Agundez, Benjamin III. Locker for a bicycle, motorcycle or the like. 239,753, 5-4-76, Cl. D6—181.
Ajax Hardware Corp.: *See*—
Read, George D., McCain, and Scott. 239,760.
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Yahagi, Mitsuhisa, Hayakawa, and Makino. 239,765.
Yahagi, Mitsuhisa, Hayakawa, and Makino. 239,766.
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Bromberg, Michael A., to Termiflex Corp. Computer input output symbol cursor type font. 239,782, 5-4-76, Cl. D64—12.
Bucknam, Gregory M. Pole clothes rack. 239,744, 5-4-76, Cl. D6—28.
Bunn-O-Matic Corp.: *See*—
Martin, John C. 239,756.
Martin, John C. 239,757.
Burden, James M., and W. J. Burden. Compartmented box or similar article. 239,762, 5-4-76, Cl. D9—185.
Chernoff, Maxwell B., to Dart Industries Inc. Hand bag. 239,785. 5-4-76, Cl. D87—5.
Claxton, Bruce A., and T. E. Hanson, to SCM Corp. Coffee maker. 239 758, 5-4-76, Cl. D7—85.
Clayton, La Verne E., to Amerock Corp. Pull. 239,752, 5-4-76, Cl. D8—169.
Cockman, George T. Combined shelf unit, plural umbrella support stand and household accessory rack or similar article. 239,747, 5-4-76, Cl. D6—85.
Dart Industries Inc.: *See*—
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Diaz, Ann: *See*—
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Eldar Electronics: *See*—
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Freed, Marvin J. 239,764.
Elfman, Allan. Target board. 239,779, 5-4-76, Cl. D34—5.
Eriksson, Marja, to ABM-Mavello AB. Liquid dosage device. 239,783, 5-4-76, Cl. D83—8.
Freed, Marvin J., to Eldar Electronics. Indicator housing for an electrical circuit tester. 239,763, 5-4-76, Cl. D10—46.
Freed, Marvin J., to Eldar Electronics. Indicator for electrical circuit tester. 239,764, 5-4-76, Cl. D10—46.
Fusselman, Robert M., to GF Business Equipment, Inc. Counter for use in post offices or the like. 239,751, 5-4-76, Cl. D6—164.
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Glantz, Lennart, and Bertil Hellzen. Adjustable ring spanner. 239,759, 5-4-76, Cl. D8—22.
Gold, Donald B., to K.I.S.S. Industries. Chair. 239,745, 5-4-76, Cl. D6—49.
Goto, Kenjiro, to Mansei Kogyo Kabushiki Kaisha. Cigarette lighter. 239,776, 5-4-76, Cl. D27—36.
Goto, Kenjiro, to Mansei Kogyo Kabushiki Kaisha. Cigarette lighter. 239,777, 5-4-76, Cl. D27—36.
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Hellzen, Bertil: *See*—
Glantz, Lennart, and Hellzen. 239,759.
Illinois Tool Works, Inc.: *See*—
Schmidt, Bradley J. 239,761.
Inoue, Toshio. Paper punch. 239,770, 5-4-76, Cl. D19—72.
K.I.S.S. Industries: *See*—
Gold, Donald B. 239,745.
Katz, Bernard. Shrink tunnel packaging apparatus. 239,781, 5-4-76, Cl. D55—1.
Kojima, Hiroshi: *See*—
Yahagi, Mitsuhisa, Kojima, and Makino. 239,767.
Kuldin, Pete. Television antenna. 239,774, 5-4-76, Cl. D26—14.
Magill, John W. Airport. 239,768, 5-4-76, Cl. D13—1.
Magill, John W. Airport. 239,769, 5-4-76, Cl. D13—1.
Makino, Shigeo: *See*—
Yahagi, Mitsuhisa, Hayakawa, and Makino. 239,765.
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Goto, Kenjiro. 239,776.
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Martin, John C., to Bunn-O-Matic Corp. Pour-in type beverage maker. 239,756, 5-4-76, Cl. D7—62.
Martin, John C., to Bunn-O-Matic Corp. Pour-in type beverage maker. 239,757, 5-4-76, Cl. D7—62.
McCain, Lawrence G.: *See*—
Read, George D., McCain, and Scott. 239,760.
Mellon, Malcolm, and Ann Diaz. Tube holder and tube cap therefor. 239,748. 5-4-76, Cl. D6—87.
Moore, Larry D. Taco forming tool. 239,755, 5-4-76, Cl. D7—43.
Narduzzi, Germana. Collapsible chair. 239,746, 5-4-76, Cl. D6—75.
Norinsky, Sidney. Convertible saddle brief case. 239,786, 5-4-76, Cl. D87—5.
Olin Corp.: *See*—
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Parisi, Fred G., to Olin Corp. Flare launching pistol. 239,771, 5-4-76, Cl. D22—1.
Paulson, Ralph E. Lighting fixture. 239,780, 5-4-76, Cl. D48—23.
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Storm, William D., to Storm Plastics, Inc. Fishing lure. 239,772, 5-4-76, Cl. D22—28.
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Wichman, William J., and Vander Ploeg. 239,773.
Vitetta, Michael G. Combined hair dryer nozzle, brush and comb. 239,784, 5-4-76, Cl. D86—10.
Wichman, William J., and R. A. Vander Ploeg, to Rain Bird Sprinkler Mfg. Corp. Trickle irrigation unit. 239,773, 5-4-76, Cl. D23—6.
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Yahagi, Mitsuhisa, Toshio Hayakawa, and Shigeo Makino, to Bridgestone Tire Co., Ltd. Vehicle tire. 239,765, 5-4-76, Cl. D12—142.
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Yoder, Warren A. Cup. 239,754, 5-4-76, Cl. D7—9.

CLASSIFICATION OF PATENTS

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2 3,954,032
51 3,954,033
117 3,954,034
207 3,954,035
749 3,954,036
794 3,954,037

CLASS 84
1.01 3,954,038
3,954,039
478 3,954,040

CLASS 89
36K 3,954,041
155 3,954,042

CLASS 90
11C 3,954,043
21D 3,954,044

CLASS 91
361 3,954,046
382 3,954,045
467 3,954,047

CLASS 92
165R 3,954,048

CLASS 93
35R 3,954,049
58.2R 3,954,050
77FT 3,954,051

CLASS 96
1R 3,954,462
1.4 3,954,463
1.5 3,954,464
3,954,465
3,954,466
1.7 3,954,467
33 3,954,468
35.1 3,954,469
36.1 3,954,470
48R 3,954,471
49 3,954,472
60R 3,954,473
66.5 3,954,474
67 3,954,475
73 3,954,476
76R 3,954,477
100 3,954,478
122 3,954,481

CLASS 99
407 3,954,052
443R 3,954,053

CLASS 101
93.1B 3,954,054
93.31 Re.28,796
99 3,954,055
269 3,954,056

CLASS 102
3 3,954,057
30 3,954,058
37.8 3,954,059
69 3,954,060
70.2GA 3,954,061
99 3,954,062
103 3,954,063

CLASS 104
138R 3,954,064
172S 3,954,065

CLASS 105
416 3,954,066

CLASS 106
1 3,954,482
44 3,954,483
47Q 3,954,484
3,954,485
52 3,954,479
53 3,954,486
54 3,954,487
62 3,954,488
89 3,954,489
90 3,954,480
99 3,954,490
100 3,954,491
109 3,954,492
127 3,954,493
270 3,954,494
307 3,954,495
308B 3,954,496

CLASS 108
57 3,954,067
124 3,954,068

CLASS 110
8R 3,954,069

CLASS 112
182 3,954,070
207 3,954,071
222 3,954,072
259 3,954,073
402 3,954,074

CLASS 113
121C 3,954,075

CLASS 114
103 3,954,076
123 3,954,077
235R 3,954,078

CLASS 115
2 3,954,079
17 3,954,080
18E 3,954,081
3,954,082
37 3,954,083
50 3,954,084

CLASS 116
124L 3,954,085

CLASS 119
1 3,954,086

CLASS 122
406S 3,954,087

CLASS 123
8.11 3,954,088
30C 3,954,089
117A 3,954,090
119A 3,954,091
142 3,954,092
143A 3,954,093
146.5A 3,954,094

CLASS 124
35A 3,954,095

CLASS 125
1 3,954,096

CLASS 126
271 3,954,097

CLASS 127
37 3,954,497

CLASS 128
2.05G 3,954,099
2.05Z 3,954,098
2.06E 3,954,100
24R 3,954,101
79 3,954,102
130 3,954,103
263 3,954,104
275 3,954,105
287 3,954,106
290R 3,954,107
325 3,954,108
327 3,954,109
349B 3,954,110
419R 3,954,111

CLASS 131
21D 3,954,112

CLASS 132
7 3,954,113
88.7 3,954,114
89 3,954,115

CLASS 134
2 3,954,498
6 3,954,499
25R 3,954,500
183 3,954,116

CLASS 135
20B 3,954,117

CLASS 136
24 3,954,501
86A 3,954,502
90 3,954,503
3,954,504
110 3,954,505
127 3,954,506
233 3,954,507
3,954,508

CLASS 137
67 3,954,118
92 3,954,119
344 3,954,120
525 3,954,121
561A 3,954,122
800 3,954,123

CLASS 138
42 3,954,124

CLASS 140
3A 3,954,125

CLASS 141
48 3,954,126

CLASS 145
32R 3,954,127

CLASS 148
3 3,954,509
6.15R 3,954,511
6.2 3,954,510
6.35 3,954,512
9R 3,954,513
11.5F 3,954,514
11.5R 3,954,515
12C 3,954,516
16.5 3,954,517
20.3 3,954,518
31.57 3,954,519
105 3,954,520
111 3,954,521
175 3,954,522
3,954,523
187 3,954,524
189 3,954,525

CLASS 149
7 3,954,526
19.2 3,954,527
19.4 3,954,528
19.6 3,954,529
22 3,954,530
38 3,954,531
45 3,954,532
98 3,954,533

CLASS 150
30 3,954,128
52R 3,954,129

CLASS 152
209R 3,954,130
354 3,954,131

CLASS 156
7 3,954,534
72 3,954,535
82 3,954,537
117 3,954,538
185 3,954,539
253 3,954,540
275 3,954,541
356 3,954,544
360 3,954,542
363 3,954,543
384 3,954,545
433 3,954,546
436 3,954,547
477B 3,954,548
486 3,954,549
3,954,550
608 3,954,551

CLASS 162
17 3,954,552
90 3,954,553
104 3,954,554
136 3,954,555
145 3,954,556
272 3,954,557
336 3,954,558

CLASS 164
23 3,954,132
76 3,954,133
266 3,954,134

CLASS 165
9 3,954,135
11 3,954,136

CLASS 166

.6	3,954,137
188	3,954,138
272	3,954,139
	3,954,140
274	3,954,141
307	3,954,142

CLASS 172

39	3,954,143
311	3,954,144

CLASS 174

15C	3,955,042
84C	3,955,044
84R	3,955,043

CLASS 176

68	3,954,559
78	3,954,560

CLASS 178

6	3,955,045
6.8	3,955,046
7.3DC	3,955,047
7.6	3,955,048
30	3,955,049

CLASS 179

1SA	3,955,050
2DP	3,955,051
18FA	3,955,052
81A	3,955,053
100D	3,955,054
115.5R	3,955,055

CLASS 180

33C	3,954,145
77R	3,954,146
89R	3,954,150
103R	3,954,151
108	3,954,152
124	3,954,153
133	3,954,147
148	3,954,149
152	3,954,148

CLASS 181

112	3,954,154

CLASS 182

20	3,954,155
107	3,954,156

CLASS 187

17	3,954,157

CLASS 188

72.7	3,954,158
106F	3,954,160
196D	3,954,159

CLASS 192

45	3,954,161
105CE	3,954,162

CLASS 195

28R	3,954,561
51S	3,954,562
76	3,954,536
127	3,954,563
	3,954,564
142	3,954,565

CLASS 197

53	3,954,163
165	3,954,167

CLASS 198

27	3,954,164
34	3,954,165
39	3,954,166
171	3,954,168
220CA	3,954,169
236	3,954,170
246	3,954,171

CLASS 200

61.58B	3,955,056
148A	3,955,057
156	3,955,058
181	3,955,059

CLASS 202

185A	3,954,566

CLASS 203

86	3,954,567

CLASS 204

9	3,954,568
15	3,954,569
	3,954,570
28	3,954,571
37T	3,954,572
43S	3,954,573
43T	3,954,574
55R	3,954,575
59QM	3,954,576
59R	3,954,577
67	3,954,578
98	3,954,579
99	3,954,580
128	3,954,581
129.65	3,954,582
158R	3,954,583
165	3,954,585
176	3,954,586
181	3,954,587
	3,954,588
186	3,954,589
195W	3,954,590
196	3,954,591
228	3,954,592
252	3,954,593
263	3,954,594

CLASS 206

1.5	3,954,172
205	3,954,173
223	3,954,174
328	3,954,175
347	3,954,176
432	3,954,177
508	3,954,178
525	3,954,180
528	3,954,179

CLASS 208

8	3,954,595
10	3,954,596
11R	3,954,597
25	3,954,598
89	3,954,599
119	3,954,600
143	3,954,601
179	3,954,602
253	3,954,603

CLASS 209

85	3,954,181
325	3,954,604

CLASS 210

7	3,954,605
14	3,954,606
23H	3,954,607
31C	3,954,608
54	3,954,609
65	3,954,610
71	3,954,611
86	3,954,612
108	3,954,613
136	3,954,614
170	3,954,615
198C	3,954,616
	3,954,617
232	3,954,618
242.5	3,954,619
275	3,954,620
314	3,954,621
404	3,954,622
436	3,954,623
439	3,954,624
445	3,954,625

CLASS 211

94	3,954,182
184	3,954,184
186	3,954,183

CLASS 214

1BB	3,954,185
1BC	3,954,186
	3,954,188
1H	3,954,189
1P	3,954,187
6P	3,954,190
17B	3,954,191
38BB	3,954,192
38R	3,954,193
75H	3,954,194
82	3,954,195
141	3,954,196
152	3,954,197
333	3,954,198
450	3,954,199

CLASS 215

31	3,954,200

CLASS 219

10.55D	3,955,060
10.77	3,955,061
68	3,955,062
211	3,955,063
216	Re.28,802
225	3,955,064
371	3,955,065
471	3,955,066
497	3,955,067
549	3,955,068

CLASS 220

4F	3,954,201
22.1	3,954,202
306	Re.28,797
334	3,954,203

CLASS 221

211	3,954,204

CLASS 222

100	3,954,205
146HE	3,954,206
212	3,954,207
402.23	3,954,208
496	3,954,209
561	3,954,210
562	3,954,211

CLASS 223

46	3,954,212

CLASS 226

7	3,954,213
76	3,954,214

CLASS 228

2	3,954,215
5.5	Re.28,798
51	3,954,216
110	3,954,217
173	3,954,218

CLASS 229

23A	3,954,219
27	3,954,220
37R	3,954,221

CLASS 235

92MT	3,955,070
92PE	3,955,069
150.2	3,955,071
151.11	3,955,072
151.3	Re.28,803
151.32	3,955,073
156	3,955,074

CLASS 236

12R	3,954,222

CLASS 239

109	3,954,223
265.13	3,954,224
265.41	3,954,225

CLASS 240

2.13	3,955,075
7.1LJ	3,955,080
	3,955,173
26	3,955,076
41.3	3,955,077
52R	3,955,078
70	3,955,079

CLASS 242

96	3,954,226

CLASS 244

3.16	3,954,228
17.13	3,954,229
44	3,954,230
83C	3,954,231
102R	3,954,232
137R	3,954,233
151A	3,954,234
153R	3,954,235
155R	3,954,236

CLASS 248

68CB	3,954,238
68R	3,954,237
96	3,954,239
104	3,954,240
188.3	3,954,241
223	3,954,242
235	3,954,243
349	3,954,244
400	3,954,245
453	3,954,246
471	3,954,247

CLASS 249

211	3,954,248

CLASS 250

210	3,955,081
211J	3,955,082
231SE	3,955,083
281	3,955,084
336	3,955,085
358R	3,955,086
360	3,955,087
363S	3,955,088
399	3,955,089
423	3,955,090
	3,955,091
468	3,955,092
493	3,955,093
527	3,955,094
550	3,955,095
565	3,955,096

CLASS 251

29	3,954,249
144	3,954,250
288	3,954,251

CLASS 252

8.5LC	3,954,629
8.5A	3,954,628
8.5P	3,954,627
8.55C	3,954,636
8.55R	3,954,626
8.6	3,954,630
8.7	3,954,631
8.8	3,954,632
	3,954,633
	3,954,634
8.9	3,954,635
12	3,954,637
40	3,954,638
47.5	3,954,639
62.1L	3,954,640
62.51	3,954,641
91	3,954,642
96	3,954,643
101	3,954,645
106	3,954,644
	3,954,646
153	3,954,647
158	3,954,648
174	3,954,649
182	3,954,650
	3,954,651
188	3,954,652
299	3,954,653
301.1R	3,954,655
301.1W	3,954,654
	3,954,661
301.4F	3,954,656
301.4S	3,954,657
312	3,954,658
313R	3,954,659
353	3,954,660
355	3,954,677
382	3,954,662
408	3,954,663
429R	3,954,664
	3,954,665
430	3,954,666
431N	3,954,667
431P	3,954,668
431R	3,954,669
432	3,954,670
451	3,954,678
455R	3,954,672
455Z	3,954,671
465	3,954,673
502	3,954,674
543	3,954,675
548	3,954,676
555	3,954,679

CLASS 254

78	3,954,252

CLASS 256

13.1	3,954,253

CLASS 260

2BP	3,954,680
2.3	3,954,681
2.5AK	3,954,686
2.5AW	3,954,684
2.5FP	3,954,683
2.5A	3,954,685
2.5B	3,954,682
17A	3,954,687
21	3,954,688
22D	3,954,689
25	3,954,690
33.2R	3,954,691
33.6AQ	3,954,692
37EP	3,954,694
37N	3,954,693
	3,954,703
38	3,954,695
42.28	3,954,701
42.32	3,954,702
42.46	3,954,704
42.57	3,954,705
45.75N	3,954,708
45.8NT	3,954,706
45.9QA	3,954,707
47CP	3,954,710
47CZ	3,954,714
47EA	3,954,712
47UA	3,954,709
	3,954,711
47XA	3,954,713
67.6R	3,954,715
75R	3,954,716
77.5AQ	3,954,718
77.5CR	3,954,719
79	3,954,723
112R	3,954,725
211.5R	3,954,726
212	3,954,727
239BD	3,954,728
239B	3,954,729
239.1	3,954,730
	3,954,731
	3,954,732
	3,954,733
	3,954,734
	3,954,735
	3,954,802
239.3A	3,954,736
239.3R	3,954,738
239.3T	3,954,737
239.57	3,954,739
240B	3,954,740
240J	3,954,742
240R	3,954,741
243C	3,954,744
	3,954,745
243D	3,954,743
247P	3,954,748
247.1T	3,954,746
	3,954,747
247.2A	3,954,749
248AS	3,954,752
248NS	3,954,750
248A	3,954,751
250BN	3,954,753
250QP	3,954,755
250C	3,954,754
256.4N	3,954,756
256.5R	3,954,757
260	3,954,758
	3,954,759
	3,954,760
268BC	3,954,765
268BF	3,954,766
268PH	3,954,763
268PL	3,954,762
268TR	3,954,764
	3,954,769
268C	3,954,770
268H	3,954,768
268K	3,954,761
268R	3,954,767
283SY	3,954,771
285.5	3,954,772
286R	3,954,773
287CF	3,954,774
	3,954,775
293.57	3,954,780
293.65	3,954,779
293.67	3,954,776
293.76	3,954,777
	3,954,778
294.8J	3,954,781
295.5A	3,954,782
306.7C	3,954,783
306.7R	3,954,784
306.8D	3,954,785
307H	3,954,786
308D	3,954,787
309	3,954,789
309.2	3,954,788
	3,954,790
	3,954,791
	3,954,792
310C	3,954,793
310R	3,954,794
314.5	3,954,795
	3,954,796
319.1	3,954,797
326.12R	3,954,799
326.5A	3,954,798
327M	3,954,801
327R	3,954,800
335	3,954,803
340.7	3,954,804
343.2F	3,954,805
343.2R	3,954,808
343.3R	3,954,806
343.6	3,954,807
343.7	3,954,809
345.2	3,954,810
345.7	3,954,811
346.8R	3,954,812
347.3	3,954,813
347.4	3,954,814
348.5L	3,954,815
404.5	3,954,816
408	3,954,817
410.9K	3,954,818
428	3,954,819
429R	3,954,821
429.7	3,954,820
435A	3,954,822
448.2E	3,954,823
448.8R	3,954,824
453AB	3,954,825
456A	3,954,827
456P	3,954,828
456R	3,954,826
465D	3,954,830
465F	3,954,829
465.8D	3,954,831
468D	3,954,832
	3,954,833
	3,954,835
468K	3,954,834
470	3,954,836
471C	3,954,837
	3,954,838
473S	3,954,839
475FR	3,954,840
475N	3,954,841
476R	3,954,842
481R	3,954,843
488R	3,954,844
501.13	3,954,845
501.15	3,954,846
502.4P	3,954,847
502.5	3,954,848
504S	3,954,849
514D	3,954,851
514G	3,954,850
515A	3,954,852
521H	3,954,853
526N	3,954,854
530N	3,954,855
533N	3,954,856
533R	3,954,857
535P	3,954,858
543P	3,954,859
553R	3,954,860
555A	3,954,861
559AT	3,954,862
564R	3,954,863
566R	3,954,864
	3,954,865
568	3,954,866
570D	3,954,867
570R	3,954,868
	3,954,869
570.5R	3,954,870
570.6	3,954,871
570.7	3,954,872
584R	3,954,873
	3,954,874
591	3,954,875
592	3,954,876
604HF	3,954,877
609R	3,954,878
610A	3,954,880
610B	3,954,879
613B	3,954,882
613D	3,954,881
614AA	3,954,883
615A	3,954,885
	3,954,886
615R	3,954,884
618R	3,954,887
	3,954,888
619R	3,954,889
621H	3,954,890
	3,954,891
622R	3,954,892
648F	3,954,893
665R	3,954,894
668B	3,954,895
	3,954,896
676R	3,954,897
837R	3,954,898
849	3,954,899
850	3,954,900
	3,954,901
860	3,954,902
873	3,954,903
	3,954,904
	3,954,905
874	3,954,906
875	3,954,907
876R	3,954,908
878B	3,954,909
879	3,954,910
	3,954,911
880B	3,954,696
880R	3,954,912
	3,954,913
	3,954,914
887	3,954,915
888	3,954,916
928	3,954,917
929	3,954,918
940	3,954,919

CLASS 261

104	3,954,920
116	3,954,921
121R	3,954,922

CLASS 264

41	3,954,924
	3,954,925
46.4	3,954,926
49	3,954,927
51	3,954,928
	3,954,929
65	3,954,930
90	3,954,931
94	3,954,923
122	3,954,932
145	3,954,933
146	3,954,934
251	3,954,935

CLASS 266

188	3,954,254

CLASS 267

34	3,954,255
64R	3,954,256
65R	3,954,257

CLASS 269

82	3,954,717

CLASS 270

67	3,954,258

CLASS 271

4	3,954,259
12	3,954,260
188	3,954,261

CLASS 273

1E	3,954,262
33	3,954,263
54A	3,954,264
80C	3,954,265
95R	3,954,266
126A	3,954,267
134CA	3,954,268
138R	3,954,269
164	3,954,270

186A 3,954,271

CLASS 274

23A 3,954,272
37 3,954,273

CLASS 277

1 3,954,274

CLASS 279

4 3,954,275
97 3,954,276

CLASS 280

11.38 3,954,278
87.04A 3,954,279
154.5R 3,954,281
251 3,954,282
273 3,954,283
277 3,954,284
405R 3,954,285
512 3,954,286
631 3,954,277
744 3,954,280

CLASS 281

15R 3,954,287

CLASS 285

93 3,954,288
158 3,954,289
322 3,954,290
341 3,954,291

CLASS 290

40R 3,955,097

CLASS 292

169.17 3,954,292
256.5 3,954,293
318 3,954,294
319 3,954,295

CLASS 296

10 3,954,296
97C 3,954,297

CLASS 297

308 3,954,298

CLASS 299

1 3,954,299
42 3,954,300
76 3,954,301
81 3,954,302

CLASS 302

62 3,954,303

CLASS 303

13 3,954,304
21F 3,954,305
22R 3,954,306
24F 3,954,307

CLASS 305

40 3,954,308

CLASS 307

205 3,955,098
218 3,955,099
221D 3,955,100
235E 3,955,102
235H 3,955,101
251 3,955,103
252UA 3,955,104
261 3,955,105
268 3,955,106
295 3,955,107
297 3,955,108

CLASS 308

9 3,954,309
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D6—	26	239,743		164	239,751		169	239,752		239,766	D23— 6 239,773	D48— 23R 239,780
	28	239,744		181	239,753		181	239,760		239,767	D26— 14F 239,774	D55— 1C 239,781
	49	239,745	D7—	9	239,754		230	239,761	D13—	1R 239,768	G 239,775	D64— 12B 239,782
	75	239,746		43	239,755	D9—	185	239,762		239,769	D27— 36 239,776	D83— RA 239,783
	85	239,747		62	239,756	D10—	46	239,763	D19—	72 239,770	239,777	D86— 10F 239,784
	87	239,748			239,757			239,764	D22—	1 239,771	D34— 5GC 239,778	D87— 5B 239,786
	89	239,749		85	239,758	D12—	142	239,765		28 239,772	PP 239,779	F 239,785
	160	239,750	D8—	22	239,759							

CLASSIFICATION OF PLANTS

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[Notice of Dec. 16, 1969, 869 O.G. 6877]

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37 : 3,954,280
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38 : 3,954,059
39 : 3,953,917
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40 : 3,953,958
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42 : Re.28,798
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44 : Re.28,793
45 : 3,954,019
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47 : 3,953,907
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49 : 3,954,552
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50 : 3,954,007
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51 : 3,954,015
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53 : 3,954,224
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3,955,122
3,955,167

DESIGN PATENTS

4	:	239,778			239,773		239,756	25 :	239,782		239,749	39 :	239,751
6	:	239,744			239,780		239,757	26 :	239,774		239,779		239,755
		239,745	8	:	239,775		239,761	34 :	239,750		239,784	40 :	239,772
		239,753	9	:	239,771		239,768		239,785		239,786	41 :	239,754
		239,760			239,781		239,769	36 :	239,748	37 :	239,747	42 :	239,758
		239,762	17	:	239,752								

PLANT PATENTS

6	:	3,876		3,879	29	:	3,877				

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

27	:	T946,011	34	:	T946,010		T946,003		T946,004	39	:	T946,002	56	: T946,005
27	:	T946,012	36	:	T946,001									

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U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, Commissioner